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Vol. XLVIII JUNE, 1936 No. 2

THE WILSON BULLETIN

A Magazine of Field Ornithology

Published by the
WILSON ORNITHOLOGICAL CLUB
at
SIOUX CITY, IOWA

Entered as Second-class Mail Matter, July 18, 1916, at the Postoffice at Sioux City, Iowa, under Act of March 3, 1879.

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is published quarterly in March, June, September, and December, as the official organ of the Wilson Ornithological Club, at Sioux City, Iowa, and is sent to all members not in arrears for dues. The subscription price is $1.50 a year, invariably in advance, in the United States. Single numbers, 50 cents. Outside of the United States the rate is $1.75. Single numbers, 60 cents. Subscriptions should be sent to the Editor.

All articles and communications for publication, books and publications for review, exchanges, and claims for lost or undelivered copies of the magazine, should be addressed to the Editor.

The current issue of the Wilson Bulletin is printed by the Verstegen Printing Company, Sioux City, Iowa.

THE WILSON ORNITHOLOGICAL CLUB

Founded December 3, 1888. Named after Alexander Wilson, the first American ornithologist, and called the "Father of American Ornithology".

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THE WILSON BULLETIN

A QUARTERLY MAGAZINE OF ORNITHOLOGY

Published by the Wilson Ornithological Club

Vol. XLVIII JUNE, 1936 No. 2

Vol. XLIII (New Series) Whole Number 176

TRENDS IN MODERN ORNITHOLOGY*

BY JOSEPH GRINNELL

When I received word from Secretary L. L. Snyder that his Program Committee wanted a few serious comments from me at this dinner—"serious" ones, mark you, and therefore to be *written*, on the subject, "Trends in Modern Ornithology", I agreed, with little hesitation. I did so with meager notion of the amount of thinking I was in for. When I did get down to the job of thinking, as we came east through British Columbia, I was at once given pause by certain difficulties of definition, two in number: What *are trends?* And what *is modern ornithology* as distinct from ancient, or from sub-modern, ornithology?

Dealing with the last difficulty first, I ventured the definition that ornithology is the mass of knowledge possessed by all students of birds at any one time. What is not known at such time, is not yet a part of ornithology. Thus, we can quite as properly speak of what was known of birds in the days of Wilson as *ornithology*, as we can of what is known today. It is the *volume* of what is known in that field of knowledge that differs from time to time.

Looking backward, from the present time-level, we can thus speak of the ornithology of the different epochs; but the total mass, and the factual and philosophical constitution of it has changed: modern ornithology shows enormous mass, relative to that of preceding epochs, and it is subdivided into a multitude of minor fields, inconceivable in number and kind only a few decades ago. Incidentally, it is simply impossible for one person nowadays to be an all-round ornithologist, as was Wilson in his day, or Coues in his. Each of us today is an avian systematist, or an avian morphologist, or an avian behaviorist, or a paleornithologist, or an avian territorialist, or—something else.

*Read at the Annual Dinner, Fifty-third Stated Meeting of the A. O. U., Toronto, October 23, 1935.

Now, that word "trend" bothered me even more. How can a person recognize the true trend of development as obtaining at any one time-level, until subsequent lapse of time has furnished sufficient perspective to enable him to do so? I could now, with enough study, state what were the trends in ornithological development in the year 1900, as judged from the literature of that in comparison with later years. But to say what the true trends are in the present year, 1935, becomes, as I now see it, a guess, or a prophesy, or merely a declaration of what one would like to see happen on the basis of his own personal interests or bent. And no two of us would be in any near agreement.

Therefore, the best I find myself able to do is to offer a brief catalogue of some of the sub-fields of ornithology that have emerged, or come to the fore, within the immediately passed few years. I will not give the names of persons who are now, or have been, identified with these fields, as I was not asked to deal with personalia. You will think of some of them as I recite the subjects of their respective research pursuits.

Perhaps standing first as to amount of recent attention accorded it, has been analytical bird-behavior, this as evinced in territoriality, in cyclical patterns in which reproduction is the central element, and in seasonal shiftings of populations both local and general. More and more intensive studies have been made along these lines, upon single species.

A tendency manifest (and a bit unfortunate) is to base very general "laws" upon one or a few such studies. A recent warning has properly been sounded against such premature generalization. Behavior patterns sharply different in certain respects from one another, or, on the other hand, strikingly alike, may have evolved in different orders of birds, even families and genera—quite as in the case of adaptive structural features.

Included in this subject of behavior is sociology in birds—inter-individual relations and reactions. I think of the phenomenon of "peck-order" recently described; that is, scale of dominance among the individuals in a group or flock. The superiority versus inferiority "complex" seems in certain birds startlingly like similar manifestations in the human animal; and it extends to the behavior of groups of individuals toward other groups. We see dictators and we see self-asserted, "superior" races—in birds!

Bird-voices and their meanings are being studied as never before, and investigated with the aid of modern recording devices. And inter-

pretations are being made in the light of findings in other animals, including man. Thus anthropomorphism, not long ago frowned upon, is coming into its own, in a certain conservative sense—in reverse!

The physiological basis of individual behavior in terms of internal secretions, or of vitamin activation, has been receiving much attention—and much recognition as if of supreme scientific importance. While a degree of importance must freely be acknowledged, we should not forget that chemico-physical mechanisms have likely been evolved on a selective basis. They have approached perfection only on the basis of selection toward ecological adaptation, that is, as imposed by special environmental pressures upon the internal structural core carried along conservatively by the machinery of inheritance.

Plumage change as being under control of varying hormone production is being recognized through studies in micro-anatomy and micro-physiology. Tie-ups with varying courses of general development become apparent.

Gross morphology is no longer content with the cataloging of structures in the dead specimen. Only as correlated with functions, does anatomy appeal to workers nowadays. And clearly this correlation carries over into behavior in all its manifestations. It is the *living mechanism* that holds the attention of the enthusiastic anatomist today. And thereby the building of new phylogenies, improvement of earlier "trees", goes on—with the increasing promise of that ideal, near-perfect system of classification which we all envision for the future. In that millennium only one A. O. U. Check-List will be needed every fifty years—instead of four in the same period!

As to systematics, the day of the brief description of new forms, and of that type of group revision which is concerned only with dead anatomical features, has nearly or quite passed. Indeed, I may say safely that there is no such thing any more as "pure systematics". Rather, does the modern student of speciation concern himself with his birds as living organisms that react in manifold ways, each species, each subspecies and each minor population group within a more or less different environmental set-up. The systematist of today is open-minded toward the findings of biologists in the field of genetics, in that of animal behavior, in that of ecology in the broadest sense; for his major problem is not only to find out how phylogeny as we see it has been attained, but how and why it is proceeding as it does in the present.

Nomenclature continues necessary, of course; but it is subservient to the aim of more and more accurate expression of truly genetic

relationships. The recent tendency appears to have been more toward synthesis than analysis; the race-group has of late come into the taxonomic scheme.

Exploration, ascertainment of geographical distribution, according to the earlier methods of amassing huge series of specimens, seeking among them new kinds and listing all the species, with meager distributional notes, has lessened in importance. Field-work on a large scale is now organized toward general ecological analysis, with searching attention to the other animals associated with the birds, and to the plant-life which is basic to the fortunes of all of the animals. Enormous possibilities remain in the direction of faunal analyses, faunal derivations, interactions of faunas, the behavior of bird populations in-the-large, both spatially and through time. This means field projects of continuing duration, projects that can be correlated for many parts of the world, projects that take into account many sorts of physical phenomena.

The main methods used in ornithology already for many years remain those: (1) of studying dead material in the museum and laboratory; (2) of experimenting upon live birds in captivity or as banded, hence more or less under control; and (3) of observing birds altogether unfettered or undisturbed in any way, under the conditions under which they carry on their natural existence. Although these three methods may best be used simultaneously, it looks to me as though the last-named method has, just now, come into greater prominence. This is the method of intensive, disciplined bird-watching out-of-doors. It is the method by which deeper and deeper insight is being gained into *birdness*—I mean as to what constitutes the animal we call a bird—*what* it does in an infinite number of respects under different circumstances, and *why* it does each of these things.

I venture to say that the outlook at this moment is exceedingly favorable for worthy contribution to science from the student of birds alive and out-of-doors, without, or with, the aid of binoculars and camera. The present trend may prove to be along that route. Thank you for listening to these "serious" remarks!

Museum of Vertebrate Zoology, University of California, Berkeley, Calif.

NOTES ON THE WINTER FOOD OF THE SHORT-EARED OWL

BY IVAN R. TOMKINS

During the fall of 1930 there was an unusual influx of Short-eared Owls (*Asio f. flammeus*), to the dunes and marshes about the Savannah River entrance, making it possible to study the food habits in the light of several years general acquaintance with the territory and its winter residents, both mammalian and avian.

Sixty-eight pellets were collected at various times during the following winter, and forwarded to the Biological Survey for identification. These pellets contained the remains of ninety-six house mice (*Mus musculus*), and four rats of the genus *Rattus*, which were most likely the roof rat (*Rattus alexandrinus*), though the Norway rat (*R. norvegicus*), and the black rat (*R. rattus*), are also to be found in this territory. Thirty-eight birds had been eaten, of which fifteen species were identifiable, though seven birds could not be separated as to species.

The entire list of birds is sufficiently interesting to be included:

2 *Porzana carolina*	Sora
1 *Squatarola squatarola*	Black-bellied Plover
1 *Arenaria interpres*	Turnstone
2 *Actitis macularia*	Spotted Sandpiper
1 *Tringa solitaria*	Solitary Sandpiper
1 unidentified shorebird	
1 *Colaptes auratus*	Flicker
1 *Sphyrapicus varius*	Yellow-bellied Sapsucker
1 *Telmatodytes palustris*	Long-billed Marsh Wren
9 *Turdus migratorius*	Robin
1 *Regulus satrapa*	Golden-crowned Kinglet
5 unidentified warblers	
1 *Molothrus ater*	Cowbird
1 *Pooecetes gramineus*	Vesper Sparrow
1 *Junco hyemalis*	Junco
4 *Zonotrichia albicollis*	White-throated Sparrow
2 *Passerella iliaca*	Fox Sparrow
3 unidentified Fringillidae	

As these pellets were collected over the major part of the winter, and in various places, individual peculiarities in feeding were subdued and a truer average was obtained. It is very likely that the winter food presents a better index to the natural feeding habits of the species than might be obtained in the breeding season, particularly if

there should then be either a plenitude or scarcity of certain forms of life. Here there was a considerable choice of food to be had, and the extreme pressure of obtaining food for a nestful of growing young did not tend to introduce aberrant habits.

Daytime feeding was not the rule here. There was no evidence that flying owls in the daytime were otherwise occupied than in trying to find a peaceful spot to rest. When flushed the owls would fly around in their peculiarly erratic way, now high, then low over the sandhills, and occasionally one would light on the nearby mudflat, to the consternation of the small shorebirds feeding there. The sandpipers would fly much as before the Marsh Hawk (*Circus hudsonius*), but the alarm was not so infectious as that caused by the sight of a Pigeon Hawk (*Falco columbarius*), sweeping low over the grass tops.

All along the dunes the roof rats and the house mice had their dens, and were abroad at all times of the day and night. This was in the same places used as day resting stations by the owls. It would be expected that an owl would emerge from its day dreams occasionally to pick up a mouse that came too close, as other observers have usually regarded this owl as somewhat of a daytime hunter. But in the same places there were thousands of Savannah Sparrows (*Passerculus sandwichensis*), creeping under the bent grasses in search of seeds. That none of this species were found in the owl pellets—unless among the three unidentified Fringillidae—is good evidence that the owls did not feed on the ground in the daytime. And when returning from the marshes at evening, we did not see the owls taking up their hunt until nearly dark.

To better determine the feeding method, the possible hunting grounds for miles around could easily be divided into three habitats, viz., (a) the marsh, (b) the shore, and (c) the shrubbery. Only the last named needs any description, and it consisted of such shrubs as myrtle, groundsel tree, cassena, and prickly ash. These shrubs were from ten to twenty feet high, and harbored in the daytime many species of passerine birds.

Disregarding the unidentified birds, the other remains could be divided loosely according to the habitat, and it was found that:

(a) from the marsh were eaten four birds of three species, and no mammals,

(b) from the shore were eaten five birds of four species, and 100 mammals,

(c) from the shrubbery were taken nineteen birds of seven species, and no mammals.

In the thick grasses of the marsh lived the rice rats (*Oryzomys p. palustris*), and the owls had eaten none of these. And in the short thick grass between the shrubbery lived, in considerable numbers, the cotton rat (*Sigmodon h. hispidus*), and this species too, was absent from the pellets. While *Sigmodon* is pretty much of a diurnal species it still is a favorite food of the Barn Owl (*Tyto alba pratincola*), which hunts only at night, so it must be abroad then as well as in the day.

In the shrubbery were many species of birds not eaten by the owls at all, according to the evidence. It was the unusual proportion of Robins that held the clue to the species taken from this habitat. It is well known that the Robins roost in the bare branches at night, and the owls must have done quite a bit of hunting over these places. To find the warblers, the woodpeckers, and the kinglets there does not seem unusual, but one might be a little surprised at the Fox Sparrows and White-throated Sparrows going to bed in the upper branches, after spending the day on the ground underneath. The thrashers, catbirds, and cardinals, all very common among the shrubs, seemed to have safer roosting habits, at least in this case.

So we have the picture of the owls hunting over the shore and mudflats, the open places in the marshes, and in the top of the bare branches. All of the shore and marsh birds might easily be found out in the open, or resting on the beach.

In the general economy of nature this is a satisfactory and successful species. Its wide range of food allows it automatically to accept the commoner or more easily captured kinds, and prevents it doing too much harm to a depleted species, except perhaps in the case of a seasonal concentration. And with its wide breeding range, it has great stability.

But when one comes to the economy that deals with credits and debits of value to humanity alone, an entirely different set of factors is introduced. And by the evidence of this study, we find the Short-eared Owl killing far too many beneficial and harmless birds to be given an entirely clear bill of health.

Further, we should not expect to find the species of much value in reducing a plague of small rodents, living in thick cover—*Microtus*, for instance—if the feeding habits are as this study shows. Fortunately other observers have found much different habits.

U. S. Dredge "Morgan",
Savannah, Ga.

NOTES ON NESTING RUBY-THROATED HUMMINGBIRDS

BY A. L. PICKENS

That one does not deliberately go into the woods to find hummingbird nests, for hummingbird nests are gifts of the gods, is the poetical idea of a certain nature writer. Nevertheless, in the southeastern states, I found a certain amount of eliminative reasoning and planning of decided value in locating the lichen-covered nest of the ruby-throat. First, the direction from the feeding grounds is apparently indicated by the flight of the bird after its feeding visit is over. Second, where it grows abundantly, the post oak (*Quercus minor*) is the favorite nesting tree of these birds—its lichen-covered branches forming a suitable setting for the similarly covered receptacle for the eggs. Third, the droning sound made by the wings of the mother as she hovers about the nest is a good guide for the ear, though at times the same sound may merely lead one to a sap-flow from the wounded bark of some forest tree.

Of nine nests observed in the vicinity of the old Richmond Church site, near Equality, S. C., six were in post oaks; two, evidently by the same individual in succeeding nesting seasons, were in one pine tree at a high elevation, and one in a small plum tree in a locality that, to the imaginative, truly seemed to stamp it as a divine gift. I had returned to the old farm on which I was reared, and was to spend a long summer vacation. It was one of those old southern farms whose original owner had helped expel the Cherokees in colonial days, leaving the soil and cherished traditions to be passed on in unbroken line to the modern owners. I had not had time to get fully settled, when from the familiar old dining table I glanced through the window, and found a female hummingbird at work constructing a nest on a limb of a small sugar plum that grew up before the window of the room above, which I was to occupy. I must confess it was a temptation to rhapsody and poetry rather than cold scientific observation. It was rather easy to personify the Old Mother, who came so near dropping a gift like that in one's lap. However, I determined to make use of this opportunity to observe at close range the nesting life of the ruby-throat in a scientific way. Spider-webs, bits of lichen, pappus, and tomentum from the lower side of white oak leaves appear to most of us rather untidy materials when seen in the crude state, but it was of such material that the midget below my window wove her nest. Sometimes she brought a lichen bit for the outside. If she fitted such to the base of the nest, she leaned far over, while seated in the cup, and placed it in position with the tip of her

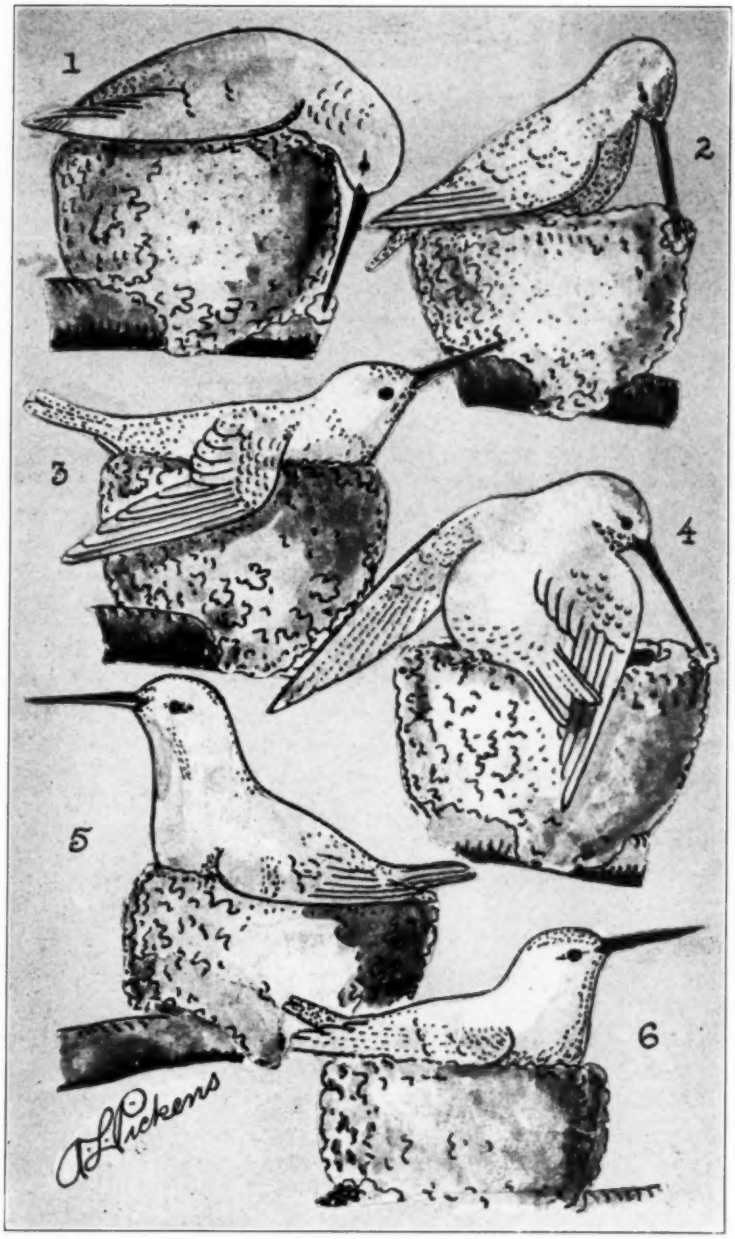

FIG. 14. Sketches of a female Ruby-throated Hummingbird in various stages of nest building and incubation.

long beak; if on the edge above she drew up her bill along the throat and attached it in the same manner. Again she brought downy lining for the inside and twisting round and about packed and felted it into place by lying partially on one side and working it into place with the feet, while one wing drooped over the edge of the nest. Then with the body twisted into an odd little knot, and the wings drooping over the edge as when working on the interior lining, she busied herself with the outside, also placing yet another bit of lichen in position. Before the final touches the first egg was deposited, incubation beginning at once. Keenly alert to surroundings, at times the mother was seen with the head held high as in the two lower figures of Figure 14. Assured of the safety of her immediate neighborhood, she would drop comfortably down into the nest as seen in Figure 15. This long vigil of incubation she varied with additional touches of lichens on the outside of the nest, the contents of the interior precluding any further work on the lining. I was surprised at the length of time required for hatching, for my information from various authors led me to expect these small eggs to be fully incubated in something like ten days. In this case I had a long wait of two weeks. The first arrival was very unlike a hummingbird, being very black, wrinkled, and naked, with a bill about one-eighth of an inch in length and almost as wide at the base. The mother leaving the nest with one egg unhatched immediately began the feeding. She went and came often, returning at times between feeding trips, not to feed the young, but merely to hover on the nest, the outside of which a few days before had received so much of her care, even to apparent plumbings of the side with her beak, which in reality may have been the plucking off of loose spider-web ends. Even the eggs, as we noted, could not stop the careful addition of a few extra lichens to the outside, but with no male assistance to feed the young, we may well imagine the female with sufficient responsibility to provide food for herself and offspring. A hummer's feet, as is the case with the pewee, are small, and little used except for perching, and the mother did not step from the edge into the bowl of the nest as larger birds might do, but lifted herself and flew this short distance! That is she would rise lightly on her wings and drop gently in to hover her charge. When she came with food she roused her baby from its slumber with a weak, gentle, little call of "*chiff-chiff, chiff-chiff, chiffit*"!

The next morning the other egg was still unhatched, and I rashly presumed it had decayed, and set about securing it for a collection I had made entirely from decayed and deserted eggs. I improvised a

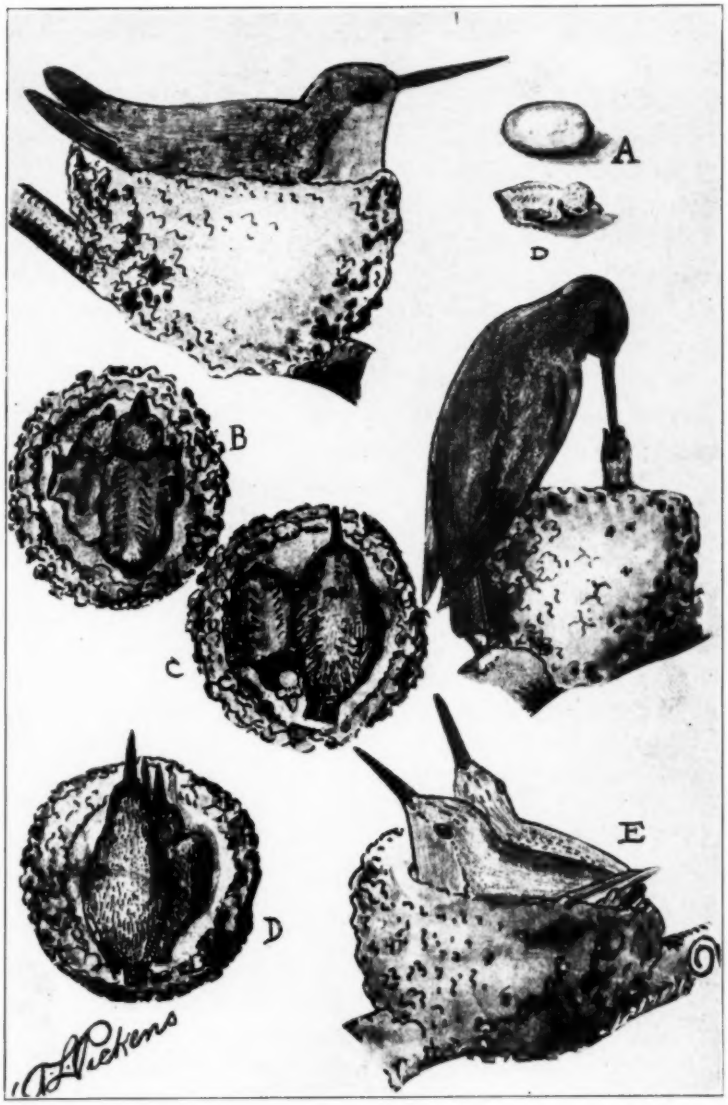

FIG. 15. Sketches showing adult female Ruby-throat sitting on the nest and in the act of feeding the young. Other figures show the young in various stages from hatching to the time of leaving the nest.

ladder and climbed up to the limb that held the nest, and reached in to get the egg. To appreciate the delicacy of this task one must recall how fragile an egg like that of a titmouse or a small sparrow is, and remember that a hummingbird's egg is smaller still. Forceps might crush it, and to take it between thumb and fore-finger was to introduce both in a space barely large enough for the thumb. The result was that I dropped the egg, and it bounced earthward by stages, striking my improvised ladder once or twice on the way down. When I picked it up it was fractured, as I recall now, quite all around the smaller diameter, and blood was oozing through the suture. Rarely have I experienced keener chagrin. That egg was no longer a mere laboratory or field specimen. Despite my memories of the kind little city boy who, visiting grandmother's, helped a chick out of the egg with disastrous results, I resolved to save the young bird in that egg. From the pantry I secured a hen egg, broke it and took some of the membrane that lines the inside of the shell, and this I wrapped around the broken exterior of the smaller egg. From time to time I moistened the membrane to keep it from growing dry and hard, keeping it warm by blowing on it with my breath, or else by holding it cupped in my palms or against my body. I was at last rewarded by vigorous movement on the part of the bird. It gave several kicks with the legs, pushed the surrounding membrane with the feet, and opened the beak as if for air. Very carefully I punctured a hole in the improvised covering quite near the bill. The movements became more insistent and I began to unwrap the outer membrane. When I had partly finished, the bird raised its head and exposed the throat to view. Through the delicate skin I caught sight of a distinct and emphatic up and down motion which was evidently the tongue and larynx adapting themselves to their new position. A few grains of sand, glued with albumen, stuck to the skin of the nestling as a result of its dangerous drop to the earth. These I carefully removed, and wetting the point of a needle I freed the midget wing that had become stuck to the side of the body by the same medium. At last it wriggled out of the remains of the shell, and lay stretched on my palm, its body about as big as a pea, its head about half that large, its feet impressing the observer by their exceeding smallness and the delicacy of the plainly visible claws. I carried it again to the nest, where the mother came and hovered it, and I soon had the satisfaction of seeing it raise its head and open its mouth to receive the long beak with which the mother regurgitated food from her crop to its own. I sketched the mother feeding

one of the pair, and the young I sketched at intervals of about three days until the green feathers began to show just a little in the wings. After about one week, one of the pair found a voice and uttered from time to time a soft little cheeping, "*Tweet*". Then they came to answer their mother with a "*tsip, tsip*", changed later to a "*psweep, psweep, psweep*", something like the cry with which a young squab greets its parents. When young of this species leave the nest this gives place to a shrill, distinct, "*tsweep*", repeated slowly and deliberately and audible for some distance, especially to the highly attentive mother, who for some time continues her feeding operations.

The skill of the young when they take to wing is one of the marvels of ornithology. How they learn so quickly to judge the nearness of a perch, and to sustain themselves without the usual drops to the ground that we find in larger species is marvelous, but once they are on the wing, he is foolish who gives them chase. I shall not soon forget dragging a heavy ladder into the wood, propping it against the limbless trunk of a tulip poplar and climbing far up into the crown following a young hummer's notes and half hoping to find a nest. It buzzed away as easily as a bumble-bee, and alighted in a nearby tree with the poise of an experienced flyer, although it was out of the nest perhaps a matter of only a few hours.

One of the nests mentioned above was quite finished by the fourteenth day of May. Nearly two months later another nest nearby held a pair about ready to fly, while the one beneath my window was almost completed by June 10. Thus, nesting activities at this place would appear to be chiefly between the first of May and the middle of July with additional time for attending the young on the wing. Curiously enough I can record but one nest of this species built in a conspicuously flowering tree. A large Albizzia, or Silky Tree, often planted in the South for shade and ornament, grew in the yard of a boyhood friend who lived about twelve miles away from my father's home in upper South Carolina. One summer this tree was selected as a nesting site by a female ruby-throat. I have found them nesting on limbs very near an immense bower of honey-suckles, but never within a blooming limb or spray of foliage of any kind, and when they do it appears to be a departure from the general habit that seeks for concealment for the nest.

Paducah Junior College,
Paducah, Ky.

THURE LUDWIG THEODOR KUMLIEN*

BY MRS. H. J. TAYLOR

Concern is expressed that the race will suffer in physical development with the passing of the pioneer. Many lives were sacrificed in homesteading, nor were all who survived physical giants, though courage, perseverance, and endurance were well-developed qualities in them. Pioneering for homes and lands is now past, but intellectual pioneering, the opening of new avenues of human understanding for the comfort and betterment of mankind, will ever be in order. New and unexplored fields of intellectual advancement are ever present, awaiting the enterprise of the pioneer in thought. The field of ornithology has had many eminent pioneers, whose studies of bird life have made valuable contributions to agriculture, or to pure science. One such pioneer in ornithology was Thure Kumlien, of Wisconsin.

Thure Ludwig Theodor Kumlien—he signed his name, Thure Kumlien—emigrated to America after graduating from the University of Upsala, Sweden, in 1843. He was a scholarly young man of unusual ability in literature and the languages of Europe. He possessed also a talent in the direction of science, and even in his college days had received recognition as a botanist and ornithologist. He settled in Wisconsin and found opportunity to follow his interest in these fields.

W. M. Wheeler gives us the following additional facts: "Thure Kumlien was born in Herrlunda Parish, Wester-gothland, Sweden, on the 9th of November, 1819. His father was an army quartermaster and owned and operated several large estates. Thure, the oldest of fourteen children, was early entrusted to a private tutor, soon entered the gymnasium at Skara, and subsequently graduated from the University of Upsala in 1843." (Supplement to the Report of the Trustees of the Milwaukee Public Museum, 1888).

Accompanied by his betrothed, Margaretta Christina Wallberg, and her sister, Thure Kumlien emigrated to America in 1843, and, after ten weeks in a sailing vessel, reached America. They went directly to Milwaukee, Wisconsin, where Thure Kumlien and Christina Wallberg were married on September 5, 1843. They then located about seventy miles from Milwaukee near Lake Koshkonong, where Kumlien bought forty acres of virgin forest from the Government, adding another forty a little later.

His first home, a log house, was near the little town of Busseyville, now called Sumner. The big living room was decorated with

*Read at the Twenty-first Meeting of the Wilson Ornithological Club, at St. Louis, December 29, 1935.

beautiful water-color pictures of birds and flowers painted by Kumlien while at the University of Upsala. In 1874 a two-story frame house was built on the home site. The log house, standing in the rear of the new home, was removed in 1908.

Kumlien's son, T. V. Kumlien, says: "The region abounded in game of all kinds common to this section. Even buffalo horns were found by the early settlers. The lake was a favorite resort for water

THURE LUDWIG THEODOR KUMLIEN, 1819-1888.

fowl, and these, with the fish and the animals, were new to him [Thure Kumlien]. The grand old forests, as yet untouched by the settlers, were swarming with birds. A great treat was in store for him in the study of the wild flowers which at that time had only been disturbed by the grazing of wild deer. The entomology of this country was an endless source of pleasure to him."

A Swedish Episcopal clergyman, the Rev. Gustav Unonius, who visited the Kumliens in 1845, but two years after the young scientist had undertaken to subdue his piece of wilderness, wrote of him: "It

was quite remarkable to see how he [Thure Kumlein] divided his time between farming and scientific researches. Necessity found [his] hand to the plough and to the hoe, while interest and desire held [his] thoughts on flowers, birds, and insects. A rich herbarium and an ornithological cabinet of no mean importance, but on account of its small capacity, not arranged in order, possibly also bears evidence to a greater field of work as a naturalist than as an agriculturist. It could very well happen that the oxen would be permitted to stand in the furrow a little longer than was necessary for their rest, in case the ploughman's eye accidentally caught a glimpse of some rare insect or of some flower of the field that had not as yet been analyzed. He united with real scientific education also an excellent ability for mounting birds and other animals, and worked in this manner in order to bring himself a small income." (Reminiscences of Gustof Unonius, 1861, in P. V. Lawson's "Life of Thure Kumlein").

Thure Kumlien was no farmer and his family of growing children would not have fared so well had it been dependent solely on the income from the farm. Angie Kumlien Main says that he earned his living by taxidermy and collecting specimens, both of which he did extensively. Many of these specimens are in the State Normal Schools of Wisconsin. His paintings of birds and flowers, most of which were made while he was in the University of Upsala, are in the possession of the family.

In a letter to President Twombly, of the University of Wisconsin, 1870-1874, Thure Kumlien says: "Having gone through the regular course of studies at the schools and gymnasium, I studied four years at Upsala University. In 1842 I made a collecting tour of some of the Islands of the Baltic [Sea] and found many specimens both of plants and birds. Among the latter was a gull that had not been found in Sweden since Linnaeus found it. . . . During the time I have lived in this country (since 1843) I have sent many large collections of birds, insects, etc., to the museums of Leyden, Holland, Prof. H. Schlegal; Berlin, Prof. Peters; Stockholm, Prof. Sundevall; Upsala, Pr. Lilljeborg; and many smaller collections to England and east in the United States; and to the Smithsonian, Philadelphia (Cassin) and to Boston Society of Natural History, of which I have been a member since 1854.

"Of plants I have sent a large collection to Prof. E. Fries, Upsala, among which plants several are by him considered different from those described in our American works. I have consequently had a great

deal of experience in collecting in almost every branch of natural history."

Among the specimens sent by Thure Kumlien to Professor Elias Fries was a purple aster that grew at Busseyville. It proved to be a new species and was named by Fries "*Aster Kumlienii*", in 1860.

Ornithologists in the east were well aware of Kumlien's wide and accurate knowledge of birds, and they sought his aid for the great work, "History of North American Birds", to which he was a generous and valuable contributor. Mrs. Angie Kumlien Main in a letter to the writer, (1932), says: "I have eighty-five letters written by Dr. Brewer to my grandfather, Thure Kumlien, all asking for information for his great work. He collected for weeks at a time for Dr. Brewer. I have hundreds of my grandfather's first copy of letters to such men as Brewer, Baird, Samuels, etc., all just teeming with his knowledge. For weeks he waded in the marshes and rushes of Lake Koshkonong to study the nesting habits of yellow-headed blackbirds. Nothing was too arduous for him when he was imparting knowledge of his beloved birds."

In a letter to Dr. Brewer, Kumlien writes: "I am poor, sir, I have to work hard to support my family and I see money but seldom. I was not brought up to work with make [which makes it] come harder for me; still I can live well here being content with little. I have bought another 40 acres of land and when I get that paid for (nearly 200$) and some more improved I calculate to let out some on shares and hope I would be able to live, with the addition of some work, on half what the field will yield and then I will have time for birds & flowers of which two things I have been passionately fond ever since a child."

In another letter to Dr. Brewer he writes: "I am glad to get fifty cents a piece for yellow-headed blackbird skins, and wish I could sell many at that price. It is easier for me kill and skin a bird than it is to go out and work hard for fifty cents a day for a farmer."

From 1867 to 1870 Kumlien held a professorship in Albion College, located a mile or two from his home, at Albion, Dane County, Wisconsin, where he taught botany and zoology, as well as some of the languages. One of his students shot a strange bird on the campus. On seeing it Kumlien exclaimed: "I have not seen that bird since I was a boy in my native land. It is *Passer domesticus*, or English Sparrow." It was the first appearance of the bird in this part of the state.

In 1870 Kumlien left Albion College, which was in financial distress, to accept an appointment from the State of Wisconsin to collect and arrange plant and animal specimens for the University at Madison and for the Normal Schools. The University collection was destroyed in 1884, when the Science Hall burned. I well remember that fire, and the repeated expression, "If only Irving's geology specimens and the Kumlien collection could be saved!" Nothing was saved. But the collections he placed in the Normal Schools are probably still in existence.

From 1881 to 1883 Thure Kumlien was employed by the Wisconsin Natural History Society. In 1883 he became Taxidermist and Conservator to the Public Museum in Milwaukee, where he remained until his death in 1888. A recent letter from the Milwaukee Public Museum says that the Museum contains about 400 bird skins, about 700 plants and flowers, and more than 200 fossils, donated by Thure Kumlien. Besides these he donated a large number of insects and shells, also the picture of a turtle painted by him.

A modest reserve made it hard for Kumlien to appear in public. His granddaughter says there is but a single article written by him, "The Disappearance of Wisconsin Wild Flowers", which he read before the Wisconsin Academy of Science. The following paragraph is from this paper. "For the last thirty-two years I have resided in the vicinity of Lake Koshkonong, in Jefferson County, Wisconsin, and have during that time paid some attention to the Fauna and Flora of that locality, and have collected somewhat extensively in nearly all the branches of Natural History, particularly Ornithology and Botany. When first I came here in 1843, a young and enthusiastic naturalist, fresh from the university at Upsala, Sweden, the great abundance of wild plants, most of them new to me, made a deep impression on my mind, but during these thirty-two years a large number of our plants have gradually become rare and even some eradicated." (Trans. Wis. Acad. Sci., Vol. 3, 1875, pp. 56-67.)

It is to be regretted that Thure Kumlien's reluctance to write and appear before the public deprived the world of first hand records from his extensive and accurate studies. Perhaps his scholarly attainments made him feel that it would be humilitating to mispronounce or blunder in verbal construction. His notes on eggs, nests, and birds, were largely answers to requests for information by eastern ornithologists, and were used directly by them. His skill in taxidermy was widely recognized. S. F. Baird, on August 30, 1880, wrote to Thure Kumlien as follows: "Would you consider twenty dollars suffi-

cient compensation for your swan? I shall be very glad to have it as an important addition to the Museum of the Smithsonian Institute." The offer was accepted.

Kumlien made a deep impress on his students, among whom his son, Ludwig, and Edward Lee Greene rank among the foremost. Ludwig followed in the footsteps of his father. Edward Lee Greene became professor of botany in the University of California. From 1895 to 1904 he was professor of botany in the Catholic University of America, Washington, D. C., and later became associate in botany at the Smithsonian Institution. A warm and life-long friendship developed between Thure Kumlien and Edward Lee Greene from the time they first met. A correspondence, which continued for twenty-six years, began when Greene went to the Civil War in 1862. A part of one letter from Greene to Kumlien, dated in 1862, at Ft. Henry, Tennessee, says: "I hope I will be in Albion next spring in time to gather *Arethusa* and *Pogonia* with you from that blessed little tamarack marsh." (Trans. Wis. Acad. Sci., Vol. 24, p. 151.) It was in this marsh that Thure Kumlien discovered a bed of *Linnaea borealis*, so named by Gronovius when Linnaeus found this small, trailing evergreen herb in Lapland in 1732. It is the only species in this genus.

Mrs. Angelia Kumlien Main records the following incident. "In a letter from Berkeley, California, dated January 9, 1885, Mr. Greene, who was then Professor of Botany at the University of California, wrote his old friend Mr. Kumlien that he had just named in his honor *Kumlienia hystricula*. In . . . describing this flower . . . Professor Greene says: 'I gladly dedicate this very characteristic plant of our Sierras to Prof. Thure Ludwig Kumlien, A. M., formerly Professor of Natural History at Albion, Wisconsin, a learned and zealous naturalist, and my first instructor in the science of botany. . . .'" (Life and Letters of Edward Lee Greene. Trans. Wis. Acad. Sci., Vol. 24, pp. 147-185.)

Professor Greene presents an interesting characterization of Kumlien in the following words: "Mr. Kumlien had been, while at Upsala, a very special favorite among the botanical pupils of Professor Elias Fries. How thoroughly worthy the youth must have been of the particular attention of the great Swedish botanist of the nineteenth century was still manifest in Mr. Kumlien when I first made his acquaintance, some sixteen or eighteen years after his arrival in this country. He was then a sort of a second and American edition of Fries. . . . He had, in 1860, . . . so well mastered the extensive and varied flora of southern Wisconsin, that there was no indigenous tree

or shrub, flower, grass, or sedge, or moss or hepatic, lichen or mushroom, the scientific name of which was not at his tongue's end.... I am confident that no state in our Union has ever had so complete a master of its whole flora, as Wisconsin had in this extraordinary man ... whom, with his low stature, muscular frame, rather stooping shoulders, light hair and keen blue eyes, a stranger might have mistaken as he passed along the country roads, for an ordinary farmer from the Scandinavian settlement, who in the most polished society would have been recognized as an intelligent, refined, and almost courtly gentleman ... whose tongue could address a foreigner in ... any one of the languages of Europe spoken between Spain and Sweden.

"... from boyhood his specialty appears to have been ornithology. It was to the birds ... that he gave most of his time. Even the fame, which he would not seek, but which was thrust on him at last, was that of an ornithologist. Lake [Koshkonong] is eight or nine miles long and three in breadth.... The still and shallow waters, bordered with green fields of reed and wild rice, were twice in each year the resort of great flocks of wild geese, pelicans and swans ... and the wooded hills and open meadows were ... the home of ... spring and summer song-birds, of grouse and pheasant. The building site which Mr. Kumlien chose ... and where he dwelt to the end of his life ... [lay] back from Lake Koshkonong, on a pleasant elevation. Oak woods enclosed the place northward and westward; to the eastward lay a stretch of open undulating arable land, suitable for farming purposes. The pristine quiet and seclusion of the place was always retained.... One reached the place by either of two by-roads, closed by gates.... A little tract of tamarack marsh ... occupied a deep abrupt depression among the heavier forest some two miles distant northward from the dwelling.... Here bloomed many rare flowers, [among them] *Arethusa bulbosa*. This was always in Mr. Kumlien's opinion the very loveliest of all North American wild flowers." (Pittonia, Vol. I, 1887-1888, pp. 250-260.)

Aside from his contact with scientists Thure Kumlien was not a well known man in Wisconsin. He had been in America more than twenty-five years when W. D. Hoard, later governor of Wisconsin, read in the Chicago *Tribune* that Louis Agassiz of Boston, considered Thure Kumlien of Busseyville, Wisconsin, the greatest authority in the world on bird nests. Hoard, who lived in the same county, had never heard of him, but set out at once to see so unusual a man, and found him plowing his field with a yoke of oxen. Through personal contact the quality and scholarly attainments of Thure Kumlien were

readily recognized. But his modesty held him in reserve, he had to be sought out. Kumlien's house and surroundings, while an ideal laboratory for a naturalist, did at the same time isolate him. He was not on the highway, nor could the house be seen from the road. Large museums, where his life would have had an immediate and natural outlet, were far removed from the middle west. He became an associate member of the American Ornithologists' Union in 1883, the year of its founding. He could not attend the meetings, and his diffidence prevented him from writing for publication. Wisconsin was a pioneer state with the usual hardships. His home was one of joy and peace. He was deeply concerned for the welfare of his family, but was never distressed. The great naturalist, trying to make a living by farming, of which he knew little or nothing, for his family of five growing children, was not annoyed by fretful complaints or distracting worries. Pioneer hardships were met and mastered in that wholesome family. The death of his rare and understanding wife in 1874 left him deeply saddened but wholly composed. Christina Kumlien and her sister Sophia Wallberg, who lived to the age of ninety years, were beloved by all who knew them. As a teacher in Albion College and in all personal contacts Kumlien's knowledge of birds and flowers, insects and mammals, was generously and effectively imparted. He gave directly, always his best, to all who came to learn from him. The name and memory of Thure Kumlien may fade when those whose lives he quickened and encouraged have gone. Thure Kumlien, the eminent scholar, thorough scientist, and rare character, was a great man, and his spirit has enriched the world.

While preparing and mounting bird skins in the Milwaukee Public Museum Thure Kumlien became suddenly ill, due to breathing the poison used in curing the skins. He was immediately taken to the Milwaukee Hospital, where he was attended by the great Doctor Nicholas Senn. He died that day, August 5, 1888, and was buried on August 7 in the home cemetery near Lake Koshkonong.

His life may be summed up in the following quotations from his biographers: "He was a man of most refined tastes, without any of the extravagant desires which such tastes often engender. He was satisfied to live most simply a life which philosophers might envy." (W. M. Wheeler, in the "Necrology", Supplement to the Report of the Trustees of the Milwaukee Public Museum, 1888.) "A purer, nobler type of the naturalist of the reserved and non-advertising class, there was not in his day, in America, than Thure Ludwig Theodor Kumlien." (Pittonia, Vol. I, pp. 250-260.)

Berkeley, Calif.

NOTES ON THE FIELD SPARROW IN MICHIGAN

BY LAWRENCE H. WALKINSHAW

Side-hills, covered with black-berry bushes, young trees or shrubs, grass grown meadows, pastures and weed-grown fence-rows are the habitat of the Field Sparrow (*Spizella pusilla pusilla*) in Michigan. It has been reported from as far north as Mackinac Island, breeding (4). Barrows mentions no other reliable record north of the Lower Peninsula in Michigan (1). I have never observed the species in the Upper Peninsula but have found it, yet in fewer numbers than both *Spizella pallida* and *Spizella passerina passerina*, in the region of Crawford and Oscoda Counties in the northern part of the Lower Peninsula. In the southern part of the state it is a common bird during the summer months and its plaintive song can be heard from its time of arrival in late March or early April, during daylight hours, until the latter part of August when nesting activities cease.

At Battle Creek migrations have been checked for several years. The species becomes fairly common during the first half of April when the males can be heard singing from their favorite perches. During October, the Field Sparrow is found in small flocks rather than singly, as in the spring, and these feed in certain favorite areas until they depart. Following is a list of migrations:

Year	First spring arrival	Common	Last of fall
1919	March 22	.....	.....
1920	March 27	.....	.....
1921	March 26	.....	.....
1922	March 27	.....	.....
1924	April 15	.....	.....
1926	April 7	.....	.....
1927	April 9	.....	.....
1929	March 30	April 6	October 13
1930	April 6	April 6	October 12
1931	April 7	April 11	October 25
1932	March 30	April 3	October 16
1933	April 6	April 15	October 22
1934	April 6	April 8	October 27
1935	March 23	April 9	.....

The earliest date of nesting which I have for the Field Sparrow is for a nest found on May 2, 1931, which contained three eggs. The latest nest is one found August 10, 1923, with four eggs from which the young left August 29. In a group of seventy nests observed, nine were found between May 1 and 15; seven during the last half of May; fifteen for the first half of June; nine for the last half; sixteen for the first half of July; five for the last half; and nine for the first half of August.

The nests of the Field Sparrow observed ranged from 5 to 120 cm. above the ground. None of the nests observed, even those placed in grass, clover, or sorrel, were resting on the ground. The majority of the nests were from 15 to 30 cm. up and were usually placed in a small bush or shrub. Sometimes a nest was found along some fence-row or road-side in a small tree some distance from the ground. A favorite spot for nesting is on the dry side-hills covered sparingly with blackberry bushes. In a compact group of these bushes, one can easily locate a flimsy nest of the species, often after the nesting season

FIG. 17. Portrait of a Field Sparrow. July 18, 1935.

has passed. Young oak trees, hazel-nut bushes, cinque foil (*Potentilla*), in fact any type of dense, short vegetation in any open field or on a dry side-hill might be a nesting site of the Field Sparrow.

These nests are made usually of very dry grass stems, roots, and weed stalks, the materials becoming finer as the inside is neared. The lining often contains horsehair, or some other hair, intermixed with very fine grasses. The whole mass varies in width on the exterior from 80 to 100 mm. The inside dimensions vary in the neighborhood of 60x60 mm. in width. Five nests measured 60x62mm., 60x55 mm., 50x50 mm., 62x48 mm., and 60x60 mm. These same nests had a depth of 40, 42, 44, 40, and 38 mm. respectively. The nest is very seldom anchored securely, with the result that many are tipped over during

heavy storms, especially, after the young are a few days old. Usually the nesting materials are merely placed in a natural crotch of one or several branches or stalks. The Field Sparrow does not weave, in or on these in any way, the materials which they bring to the nest.

The eggs have been described (3) as "pale greenish-blue, bluish-white or white, speckled, spotted and penciled with shades of brown, chiefly at the larger end; may be occasionally thickly marked all over, obscuring the ground color." There is a similarity in the color of markings of eggs of the same set but often there is a remarkable difference in color in different sets. The number of eggs varies from two to five. I have three records of complete sets of two eggs (Nos. 6, 9, and 16); eighteen records of sets of three; twenty-one sets of four; and three sets of five.

The measurements of fourteen eggs were 20x13.5, 18.5x13.5, 18.5x13, 18.5x13, 17.5x13, 18.8x14, 17.5x14, 18x13, 18x13, 17x13, 18x13, 17.5x14, 18x13, and 17.5x14 mm., averaging 17.95x13.35 mm. The average weight of eighteen eggs was 1.6 grams. There were, one set of three, averaging 1.76 grams; one set of three averaging 1.33 grams; one set of four, averaging 1.55 grams; one set of four, averaging 1.57 grams; and another set of four, averaging 1.75 grams.

Following is a list of seventy nests which I have observed in Michigan:

No.	Date found	Contents	Location	Outcome	Complete set of eggs
1.	June 14, 1919	5 young	Calhoun Co.	Left nest June 18	5
2.	June 21, 1919	4 eggs	Calhoun Co.	Left nest about July 10	4
3.	May 11, 1920	4 eggs	Calhoun Co.	2 young left May 28	4
4.	May 23, 1920	1 egg	Calhoun Co.	Destroyed	x
5.	June 5, 1920	1 egg	Calhoun Co.	Destroyed	x
6.	June 6, 1920	2 eggs	Calhoun Co.	Destroyed	2
7.	June 6, 1920	4 young	Calhoun Co.	4 young left June 10	4
8.	July 25, 1920	3 eggs	Calhoun Co.	Destroyed	3
9.	Aug. 8, 1920	2 eggs	Calhoun Co.	2 young left Aug. 21	2
10.	Aug. 8, 1920	3 young	Calhoun Co.	3 young left Aug. 14	3
11.	June 1, 1921	4 young	Calhoun Co.	4 young left June 1	4
12.	June 4, 1921	1 young	Calhoun Co.	1 young left June 4	x
13.	July 5, 1921	1 young	Calhoun Co.	1 young left July 5	x
14.	Aug. 12, 1921	2 young	Calhoun Co.	2 young left Aug. 12	x
15.	May 4, 1922	0 eggs	Calhoun Co.	Destroyed	0
16.	May 12, 1922	2 eggs	Calhoun Co.	Destroyed	2
17.	May 17, 1922	1 egg	Calhoun Co.	Destroyed	x
18.	May 18, 1922	2 eggs	Calhoun Co.	Destroyed	x
19.	May 21, 1922	4 eggs	Calhoun Co.	4 young left June 5	4
20.	May 21, 1922	3 eggs	Calhoun Co.	Destroyed	3
21.	Aug. 6, 1922	2 eggs	Calhoun Co.	3 young left Aug. 24	3
22.	June 3, 1923	2 eggs	Calhoun Co.	Unknown	x
23.	June 17, 1923	4 eggs	Calhoun Co.	4 young left June 29	4
24.	July 3, 1923	1 egg	Calhoun Co.	Destroyed	x
25.	July 9, 1923	4 eggs	Calhoun Co.	Destroyed	4

No.	Date found	Contents	Location	Outcome	Complete set of eggs
26.	Aug. 10, 1923	4 eggs	Calhoun Co.	4 young left Aug. 29	4
27.	July 19, 1924	0 eggs	Calhoun Co.	Destroyed	x
28.	July 24, 1924	3 young	Calhoun Co.	3 young left July 31	3
29.	Aug. 10, 1924	3 eggs	Calhoun Co.	Destroyed	3
30.	May 10, 1925	3 eggs	Calhoun Co.	Destroyed	3
31.	June 8, 1927	4 eggs	Calhoun Co.	Destroyed	4
32.	May 13, 1928	4 eggs	Ann Arbor, Washtenaw Co.	Destroyed	4
33.	Aug. 5, 1928	4 eggs	Calhoun Co.	Destroyed	4
34.	Aug. 12, 1928	1 egg	Calhoun Co.	Destroyed	x
35.	June 2, 1929	4 eggs	Washtenaw Co.	Unknown	4
36.	July 13, 1929	3 eggs	Calhoun Co.	Destroyed	3
37.	June 9, 1930	Empty	Calhoun Co.	Destroyed	x
38.	June 14, 1930	3 eggs 1 Cowbirds	Calhoun Co.	Unknown	x
39.	June 21, 1930	3 eggs	Calhoun Co.	Unknown	3
40.	June 22, 1930	4 young	Calhoun Co.	4 young left June 28	4
41.	June 22, 1930	4 young	Calhoun Co.	4 young left June 29	4
42.	June 29, 1930	x young	Calhoun Co.	Unknown	x
43.	July 4, 1930	3 eggs	Ann Arbor, Washtenaw Co.	Unknown	3
44.	July 4, 1930	3 eggs	Wayne Co.	Unknown	3
45.	July 6, 1930	x eggs	Milford, Livingston Co.	Unknown	x
46.	July 10, 1930	2 eggs	Calhoun Co.	Unknown	x
47.	May 2, 1931	3 eggs	Calhoun Co.	Unknown	3
48.	May 13, 1931	4 eggs	Calhoun Co.	Unknown	4
49.	May 15, 1931	5 eggs	Barry Co.	Unknown	5
50.	June 7, 1931	1 young	Barry Co.	1 young left June 8	x
51.	May 22, 1932	4 eggs	Barry Co.	Unknown	4
52.	June 8, 1932	3 eggs	Calhoun Co.	Unknown	3
53.	June 10, 1932	3 young	Calhoun Co.	Unknown	3
54.	July 14, 1932	4 young	Calhoun Co.	Unknown	4
55.	May 14, 1933	5 eggs	Barry Co.	Unknown	5
56.	June 4, 1933	4 young	Calhoun Co.	Unknown	4
57.	June 21, 1933	1 egg	Calhoun Co.	Unknown	x
58.	Aug. 6, 1933	3 young	Barry Co.	Unknown	3
59.	June 25, 1934	1 young 2 eggs	Calhoun Co.	Unknown	3
60.	May 18, 1935	1 egg 3 Cowbirds	Kalamazoo Co.	Unknown	x
61.	June 25, 1935	1 egg 2 Cowbirds	Calhoun Co.	Deserted	x
62.	July 2, 1935	3 eggs	Calhoun Co.	3 young left July 19	3
63.	July 7, 1935	Construct'n	Calhoun Co.	Storm tipped nestover	4
64.	July 11, 1935	1 Cowbird egg	Calhoun Co.	Deserted	x
65.	Juy 11, 1935	Empty	Calhoun Co.	Unknown	x
66.	July 11, 1935	Empty	Calhoun Co.	Unknown	x
67.	July 11, 1935	2 eggs	Calhoun Co.	2 young left July 29	3
68.	July 12, 1935	1 egg 2 Cowbirds	Calhoun Co.	Destroyed	x
69.	July 22, 1935	4 eggs	Calhoun Co.	Destroyed	4
70.	July 24, 1935	4 eggs	Calhoun Co.	Destroyed	4

Of the seventy nests, forty-six were followed until destroyed, deserted, or until after the young had left the nest. The forty-six nests contained 119 eggs or young for an average of 2.5 per nest. Twenty of these brought off sixty young from sixty-three or more eggs. There were three nests of one young; four of two; four of three; eight of four; and one of five. The Field Sparrow has much better luck than its close relative, the Chipping Sparrow, in this part of Michigan.

Nest No. 6. This nest was only 5 cm. from the ground. It was built in tall grasses in heavy shade of three large black-walnut trees almost in the farm-yard.

Nests Nos. 37, 40, 41, 44, and 59 were in black raspberry bushes.

Nests Nos. 49, 61, 63, 64, 65, 66, and 67 were in black-berry bushes.

Nest No. 62. July 2, 1935, at 7 A. M., three eggs, averaging 1.76 grams per egg in weight. Nest in mass of bushy cinque foil (*Potentilla fruticosa* L.) Nest 15.5 cm. from ground. July 11, 7 A. M. and 6:30 P. M., three eggs; July 12, 6:30 A. M., one egg and two newly hatched young.

WEIGHTS OF YOUNG (Grams)

	July 12 6:30 A.M.	July 14 8:00 A.M.	July 15 8:30 A.M.	July 17 7:30 A.M.	July 18 7:30 A.M.
No. 1	1.85	4.5	8.3	9.8	10.3
No. 2	1.85	4.5	7.9	9.0	9.8
No. 3	xxx	3.1	6.4	7.2	9.3

July 18 young showed fear when handled. Feathers showed several mm. beyond quills, in oldest two. July 19, 6:30 A. M., entered blind which had been erected at nest. Adults fed young several times while I photographed them. Left blind at 8 A. M. Young, two largest, two wing bars, breast was creamy color; maxilla, bluish; mandible, lighter; tomia, yellow near base, grayed at tip.

The incubation period at this nest was at least eleven days; two young remained in the nest seven days and the younger six. The young hatched over a period of twenty-four hours indicating that incubation commenced one day before the last egg was laid.

Nest No. 63. July 7, 1935, nest about two-thirds completed. July 8, one egg; July 11, noon, four eggs; July 21, three young just hatched, other egg found outside of nest.

WEIGHTS OF YOUNG (Grams)

	July 21 11 A.M.	July 22 6:30 A.M.	July 23 6:30 A.M.	July 24 6:30 A.M.	July 25 A.M.
No. 1	1.55	2.6	4.3	5.55	7.4
No. 2	1.6	2.6	3.8	5.0	6+
No. 3	2.0	Gone	xxx	xxx	xxx

When the nest was visited on July 25 it had been tipped over by a severe rain of the night before and both young were on the ground dead. One had been eaten somewhat by ants.

The nest was built in a large black-berry patch. It was 31 cm. from the ground to the rim. The eggs averaged 1.33 grams each on July 11.

The incubation period was ten days. The young were nearly four days old when killed. Only one parent was observed to feed the young.

Nest No. 67. Found July 11, 1935, two eggs. July 13, 6:30 A. M., four eggs; July 21, 6:30 A. M., four eggs; July 22, 6:30 A. M., one young, three eggs; July 23, 6:30 A. M., three young and one infertile egg.

WEIGHTS OF YOUNG (Grams)

	July 22 6:30 A.M.	July 23 6:30 A.M.	July 24 6:30 A.M.	July 25 2:00 P.M.	July 26 8:00 P.M.	July 28 10:00 A.M.
No. 1	1.9	2.55	3.3	5.8	9.4	10.9
No. 2	xx	2.55	2.9	5.4	Gone	xxx
No. 3	xx	1.1	2.6	4.6	7.3	9.4

The young left the nest July 29 in A. M., when six and seven days old; the incubation period was ten days. The nest was in black-berry bushes on a steep side-hill. It contained much horsehair in the lining, and was 290 mm. from the ground to the rim.

Nest No. 68. This was the only nest of the Field Sparrow found, containing Cowbird eggs, which was not deserted, but on July 15 at 7 A. M. when it was visited it had been torn from its bush and was scattered about the vicinity.

Nest No. 69. July 22, 1935, 6:30 A. M. and 8 P. M., four eggs; July 23, 7 A. M., two young and two eggs; July 24, 7 A. M., four young; July 31, about 4:30 A. M., cat tipped nest over. How many young were caught is not known.

WEIGHTS OF YOUNG (Grams)

	July 23 7:00 A.M.	July 24 7:00 A.M.	July 25 2:00 P.M.	July 26 8:00 P.M.	July 28 10:00 A.M.	July 30 6:30 A.M.
No. 1	1.9	3.5	5.0	8.6	9.7	10.7
No. 2	2.0	3.5	4.5	7.8	9.4	10.4
No. 3	xx	2.8	4.3	7.8	8.9	9.6
No. 4	xx	1.85	3.3	5.7	8.1	9.4

The average weights of the eggs on July 22 was 1.76 grams. Incubation period not known; nestling period seven and eight days. This nest was located in a red raspberry patch in the garden on my father's farm. It was 71 cm. from the ground to the rim of the nest.

Nest No. 70. This nest was located along the roadside in a small oak and was 120 cm. from the ground. Egg weights, averaged 1.75

grams. The nest contained a great deal of horsehair for lining. The outside dimensions were 95x95 mm.; the inside 60x60 mm.

Often the birds are parasitized by the Cowbird (*Molothrus ater ater*). Some of these nests were not recorded but during 1935 in twelve nests, four contained six Cowbird eggs and only three Field Sparrow eggs. These nests were all deserted, except one.

Blinds were erected at nests 62, 63, and 69. In no case could I be sure that the male helped in feeding the young, the female apparently doing all or nearly all of the home duties while the male sang from some nearby perch. When an intruder approached the nest he, however, came immediately to the nest and scolded as much as she. The young were fed eleven times in nest 63, during a period of two hours, from 9-11 A. M. The food at all three nests was mostly insects. The excreta were swallowed by the female after feeding. Only one of these was eaten at a time. Egg-shells and dead young were removed from the nest and it was usually very tidy even when the young were ready to leave.

The lightest fledgling was a bird of 1.1 grams. Most of them hatched during the night and the following morning weights ranged between 1.55 and 2.0 grams. The young, when they were ready to leave the nest, weighed about 10.5 and 11 grams. Adults weigh only one or two grams more than this (2).

The male Field Sparrow is a very persistent singer. His song has been heard during all of the daylight hours from late March until the first of September and even during autumn migrations in the latter part of October I have heard the song uttered in a half-hearted manner from some member of a feeding flock. During the hot days of late July and August, when nearly all bird voices become quieted during the middle of the day one can feel sure that if he drives to a brush covered field he will hear the song of the Field Sparrow.

Two common songs were observed, "*see-a—see-a—see-a—see-see-see*" and "*see-e—see-e—see-e-see-see-see*". These songs vary, but the songs of one male always seem to be the same monotonous yet attractive notes, over and over all day long. The time of the song is about two seconds by the stop-watch. The usual rate of singing was about four or five times per minute, even during the middle of the day.

The regular alarm note is a rapid chipping, uttered by both parents, while another call, a note of contentment, is a low "*See-see-see-see*". Another call, when the young were in danger, uttered by the parent was "*Che-che-che*", the young freezing immediately. The young called a low "*chip*" when calling for food, after leaving the nest.

SUMMARY

The Field Sparrow arrives from March 22 to April 15 in the region of Battle Creek and leaves for the south between October 12 and 27. The nesting season extends from May 1 until the last week in August, probably two or more broods being reared in a year. Three and four are the average number of eggs. These average about 1.6 grams in weight. The young weigh about 1.1 grams or a little more when hatching and when ready to leave the nest weight about 10.5 grams. The female does the feeding according to my observations. The young remain in the nest six to eight days.

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BATTLE CREEK, MICH.

RESTORATION OF ROADSIDE COVER BY THE C.C.C.

BY WILLIAM JOHNSTON HOWARD

Much of the roadside beauty of the Illinois prairies has yielded to agriculture and commerce. The bushy hedge row with its diversity of plants and seasonal color changes has been replaced by the prosaic wire fence; highway cuts have hastened erosion and many of the trees have made way for the hot dog stand and the oil station. These newer uses of the roadside have been accompanied by less obvious changes. Grasses which become highly inflammable in dry seasons have supplanted the hedge row. The only recreation the road now affords is down the concrete slab, and wildlife, once a natural part of the fence row, has disappeared. The roadside has become, in many instances, drab and dreary. For the most part it is uninteresting.

East of St. Charles, Illinois, the State Highway Department has acquired rights of way two hundred feet deep and fourteen miles long, upon which was built U. S. Highway 64. A World War veterans company of the Civilian Conservation Corps, under the direction of the U. S. National Park Service, is engaged upon a program of highway beautification and roadside utilization on this strip. Power line poles, bill boards, fences, and structures are being removed. Grading, erosion control, elimination of blind intersections, construction of wayside trails and small bridges, and an extensive planting program are being undertaken by the C.C.C. in an effort to restore the former

FIG. 18. Showing artificial changes in road margins. Top, example of original roadside condition; middle, showing the C.C.C. crew sloping the bank preparatory to planting; lower, a finished piece of roadside, after it has been graded and planted.

beauty, give the roadside some recreational values such as hiking and horseback riding, and eliminate the sordid appearance which so often characterizes highways near cities.

While this project was essentially designed to improve the scenery along the thoroughfare, the planting program gives it significance as a cover restoration measure. Upon two fourteen-mile strips of prairie, which have been denuded of song bird and small mammal cover, native vines, shrubs, and trees are being replaced. Many species of native plants having known value as food and cover are being used in an informal planting scheme. In time, the result will be a double row of thicket and woodland, with occasional short breaks for vistas and road intersections.

Due regard is being given to ecological associations and as much diversity as is consistent with natural groupings is being observed in the plantings. Willows, red osier dogwoods, and other moisture loving plants will again grow on the banks of the few streams crossing the highway. On the drier upland soils the plant material will be as carefully selected. Groves of shade trees will be flanked by shrubby growth when such conditions would be found naturally. Occasionally there will be dense tangles of vines. The finished job will have little formality about it, except at road intersections where low growing shrubs will be used, as trees would tend to create conditions dangerous to the automobile driver. It will not be possible to make more than a skeletal planting, but as time goes on natural reproduction will fill the voids and other plants desirable to some of the small forms of wildlife, will undoubtedly find their way into the scheme.

It is known that an acre of fence row supports a heavier population of certain birds and small mammals than do many acres of solid cover. What the effect of this project will be on song birds we can only conjecture, but it seems plausible to assume that this, as well as a number of similar projects directed by the National Park Service, will do much towards increasing bird life in the immediate vicinity. It is hoped that the project, in addition to its objective of pioneer highway beautification, will serve as a demonstration and as an example for restoring roadside cover.

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SOME OBSERVATIONS ON THE RUFFED GROUSE IN WISCONSIN

BY WALLACE GRANGE

While I was living on the family homestead in the cut-over, forested region twelve miles northwest of Ladysmith, in Rusk County, Wisconsin, I had an unusual opportunity to observe the Ruffed Grouse (*Bonasa umbellus togata*, Linnaeus). The species was almost a dooryard bird with us. Grouse could frequently be seen budding in the trees about the buildings.

THE GROUSE POPULATION. For my own satisfaction rather than from any effort to accomplish a piece of research, I kept a written record of all species seen each day, with either an actual count or an estimate of the number of individuals of each. A compilation of these records for the Ruffed Grouse is of interest, in connection with the numerical fluctuation of the grouse population now known as the cycle.

The table summarizes the compiled records. The chart shows the last four (lettered) columns of the table in graphic form. Curves A, B, and C all indicate a population peak about 1922 and a low about 1927, which corroborates the generalized Wisconsin Ruffed Grouse curve compiled by Leopold from reports of game observers (see Game Survey of the North Central States, p. 144). The parallelism with Leopold's curve is even closer when allowance is made for the interpretive comments to be made later.

TABLE 1. Indicators of Ruffed Grouse Abundance near Ladysmith, Wisconsin, Northern Thornapple and Southern Hubbard Townships, 1919-1930.

Year	No. days on which grouse were seen	A Number grouse seen	B Av. No. grouse seen per day	C Most grouse seen in one month	D Highest daily average in one month
1920	150	687	4.5	106 (Nov.) (13 days)	9.3 (Dec.) (11 days)
1921	141	812	5.7	120 (Apr.) (20 days)	27.5 (Nov.) (2 days)
1922	120	1050	8.7	240 (Apr.) (17 days)	14.1 (Apr.) (17 days)
1923	51	384	7 5	70 (Apr.) (10 days)	25.0 (July) (1 day)
1924	21	120	5.7	47 (Apr.) (3 days)	15.6 (Apr.) (3 days)
1925	6	28	4.7	28 (Dec.) (6 days)	4.8 (Dec.) (6 days)
1926	17	54	3.2	24 (Feb.) (5 days)	4.9 (Feb.) (5 days)
1928	1	3	3.0	3 (Oct.) (1 day)	3.0 (Oct.) (1 day)

The figures in the table should be considered as qualified by the following notes:

1920-24. The daily averages (B) do not reflect the actual abundance, since grouse were often seen in and from the yard, and such figures are averaged along with others on which ten or more miles were covered on foot through good country. If the averages pertained only to days of active field work, I believe the daily average would be above ten.

1925-26. The daily averages do not accurately reflect the *scarcity of grouse at* that time. I traveled 600 miles by team and by foot (all within the limited area under discussion), yet I recorded grouse only 82 times. The days on which no grouse were seen are *not* averaged with the others. Had this been possible, I believe the daily average would be less than one grouse.

1919. No written records. Drummers numerous, as many as six heard from one point by my father, in May. Several large broods seen in summer.

1920. Written records for entire year.

1921. Written records for every month except August.

1922. Written records for entire year. This season represents my most consistent field work for the period.

1923. Written records for every month except December. Field work much reduced.

1924. Written records to July 1. No field work last half of year, and field work first half reduced. Grouse were reported abundant that fall. Bags of five taken in a few hours in the open season.

1925. No field work except for December.

1926. Written records up to March 15. No field work during remainder of year.

1927. No written records. Field work confined to a few days in December. My father, and all other residents with whom I talked, reported grouse extremely scarce, or virtually extinct.

1928. Field work confined to one day in October. I covered twenty-four miles of good clover-sodded forest roads and saw three birds, two of which were drumming. Inquiry indicated that there were a few more grouse this year than last, but still scarce. (It is also of interest that in covering several thousand miles of Wisconsin roads off this area, by auto, during the summer and fall, I noted less than a dozen grouse. In 1922, I should have seen as many in two miles of good road).

1929. Field work confined to two mornings a few miles east of the original territory. At that time (September), I had little difficulty in collecting four grouse. Residents reported grouse very definitely increasing.

1930. No field work in the vicinity. It was common knowledge among residents that grouse were again fairly numerous, and apparently increasing rapidly.

I should summarize the above chart by saying that Ruffed Grouse were numerous and probably increasing in 1919; that they were abundant in 1920, 1921, 1922, and 1923; that they were possibly less numerous in 1924, and very positively were scarce in late 1925 and early 1926; that they were extremely scarce, almost to local extinction, in 1927; that they were increasing in 1928, 1929, and 1930 and by the fall of the last year had made substantial recovery.

As to the numerical abundance of grouse, I am able to make a fairly satisfactory estimate for our particular quarter section (160 acres). This tract was almost ideal grouse range. It contained a considerable acreage of 20-30-year-old aspen, birch, and balsam; an-

other higher woods of sugar maple, birch, ironwood, basswood, and balsam, with large elms along a wet weather "run"; a fine little black spruce swamp much used by grouse in winter; a typical hardwood "burn", grown up to raspberry and hazel, with the old birch, maple, and balsam stubs still standing; a long, irregular marsh with many arms extending into the woods and fringed by black alder thickets. The balance of the tract was cut-over pasture, cultivated crops, and open grass marsh.

There were approximately 100 acres of occupied grouse range in 1922, the year in which I did the most intensive field work. This is not necessarily the year of maximum abundance of grouse. In fact, I cannot say which of the four years, 1920 to 1923 inclusive, or possibly 1924, was the point of maximum abundance, but only that there were many grouse in each one of these years. I can mentally account for forty-five "grouse spots" where I could be fairly certain of finding birds in the spring and summer season, and I believe that in 1922 there were forty-five grouse in the 100 acres just prior to nesting. This is a density of 2.2 acres per grouse.

In winter I think there were, at times, in excess of fifty birds in the 100 acres. I think there was an influx of outside birds coming in to the bardwood for budding and to the spruce swamp for roosting.

I have made no attempt to estimate the fall grouse population, because at this season grouse roam, combine in groups, and shift position locally. In the spring the grouse are sedentary, drummers and hens alike being almost anchored to their breeding territories. But the fall population did not ever reach the total that one might have expected on the basis of the spring population.

It is my opinion that in the spring of 1927 there were not more than five grouse on the quarter-section, although this estimate is arrived at with less assurance than the figure of forty-five for the spring of 1922. To what extent, if any, local fires in the preceding years may account for this drop, I am uncertain. At the time I thought fires had some part in the reduction, but I now believe that they were a minor factor.

Number of Predators and Rodents. It is sometimes stated that predators, deprived of their normal rodent food supply, turn to game. Grouse scarcity in the past has even been mentioned as *an effect* of rodent scarcity. Also, in the discussions of population cycles, it is often considered that rabbits die first, that is, before Ruffed Grouse.

However, at Ladysmith, I noticed a very marked and very general scarcity of Ruffed Grouse in the winter of 1925-1926, but during

the same period I had no difficulty in trapping Snowshoe Hares (*Lepus americanus phaeonotus*) for study purposes, and I was amazed at the prodigious numbers of Red-backed Voles (*Evotomys gapperi* subsp.) in the spruce swamp, trapping dozens of them, several in a night. Deer mice (*Peromyscus* sp.) were also common in the woods, and Cottontail Rabbits (*Sylvilagus floridanus mearnsi*) and Meadow Mice (*Microtus p. pennsylvanicus*) were present in numbers. In short, grouse but not rodents had become scarce during the winter of 1925-

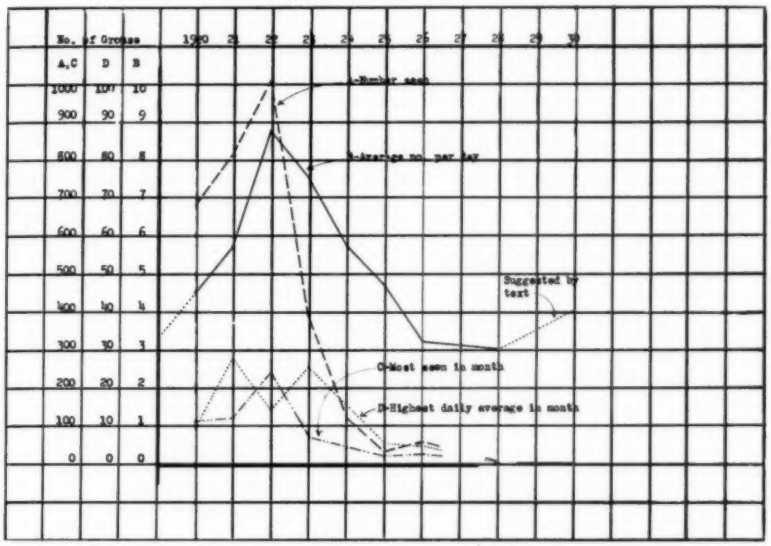

FIG. 19. Graph of Ruffed Grouse population levels near Ladysmith, Wisconsin, 1919-1930. See columns A, B, C, D of Table 1.

1926. In fact, under date of December 20, 1925, I recorded that Snowshoe Hares were "just as numerous . . . as I ever knew anywhere".

I believe that Snowshoe Hares were the most abundant on our land in 1919 and 1920, at which time we often hunted them successfully during the lunch hour. They were abundant, however, during the entire period recorded in the table. When I returned for a short visit in December, 1927, there were many runways in the spruce swamp, and I saw several of the animals. Even though a general scarcity of Snowshoe Hares was thought to exist at that time, high school boys at Ladysmith trapped several hares for me in 1927 and 1928, which is further evidence that hares were still present in some numbers. But, relatively reduced or not, they were much more abundant than the Ruffed Grouse, so the theory that predators turn to grouse through

necessity would certainly not apply to the Ladysmith region during the period here under discussion.

I did not see any evidence of abnormal predation on grouse. The predators in the locality included coyotes, skunks, and house cats (fairly numerous); timber wolves, bobcats (rare); weasels and mink (in varying numbers); Cooper's Hawks (common); Red-tailed and Red-Shouldered Hawks (fairly numerous); Goshawks and Snowy Owls very rare). One Goshawk was seen on January 12, and one each on February 13 and 14, 1926. Cooper's Hawk kills of young grouse were quite commonly noted in July, August, and September, and were, apparently, of perfectly normal occurrence.

I am certain that hunting did not cause the scarcity of grouse because in Rusk County there are many sections so remote from roads, and so rarely visited by hunters, that the effect of such hunting as does occur is negligible. Yet grouse became scarce in the unhunted as well as in the hunted areas.

General Observations

Drumming Records. Dates when drumming was first noted are: For 1920, March 26; for 1921, March 28; for 1922, April 9; for 1923, April 19; for 1924, April 13. The later dates for 1922-1924 do not indicate actual lateness, but rather lateness of the field work, or unfavorable weather conditions on the days when I was in the field.

I have Rusk County drumming records for each of nine months of the year, the exceptions being January, February, and July. Drumming reaches its peak during the last few days of April and the first ten of May. I have numerous records of grouse drumming in the moonlight, a common thing in spring and summer, I think particularly in late August.

Interesting drumming records include: August 24, 1921; August 25, 1920; September 5, 1923; September 18, 1921; October 14, 1923; November 13 and 25, 1922; December 1, 1921 (ten to twelve inches of snow on the ground); December 1, 1922; June 27, 1922; June 28, 1921. The period from June 28 to August 24 is certainly partly occupied by the molt so that no drumming would be expected, but the winter period, December to March, may eventually produce drumming records.

Nest Records. Nesting dates include: May 7, 1922, two nests, one with thirteen and one with eleven eggs; May 10, 1922, twelve eggs; May 18, 1920; and May 19, 1920. I have two hatching dates, namely June 1 and 4, 1922. In one case eleven of thirteen eggs hatched and

in the other, eight of eleven. On this date one dead young was found at the nest, and a second bird had died without emerging from the shell, although it had successfully pipped it.

BUDDING. It is well known that the Ruffed Grouse is a great eater of buds. It does not seem to be so well known that buds are consumed at seasons when the birds are not driven to it by necessity. The budding of aspen, for example, is common in September when there is still much other, and seemingly more desirable, food. I have three notes of Ruffed Grouse budding ironwood (*Ostrya virginiana*) in October, 1921 (on the 9th, 10th, and 29th), and a note on August 19, 1921, indicating that a grouse had eaten aspen leaves.

Ruffed Grouse breakfast almost before dawn on the very cold, sharp mornings of mid-winter, and perhaps at other times. On January 23, 1922, I observed five Ruffed Grouse busily at work budding in the tree tops where they could be seen silhouetted against the horizon while a few stars and the new moon were still bright. The mercury stood at 31° below zero. On January 1, 1924, another grouse was budding in an aspen tree at dawn; the temperature was 30° below zero. During the same cold snap, on January 7, the same habit was observed, and it has been frequently noted at other times. It would almost seem that the colder the morning, the earlier the breakfast of the Ruffed Grouse.

ROOSTING. The winter roosting habits vary greatly with the weather. When the snow is ten or more inches deep and is loose and fluffy, the grouse, as is well known, plunge into and under it. There, at the end of a short burrow (from ten inches to five feet long) they sit quietly for long periods. They may remain beneath the snow for as many as eighteen hours, as can be determined when one finds grouse still in burrows late in the morning although a fresh snow fell the evening previous.

The burrow is sometimes straight and sometimes curved or fish-hooked. If disturbed, the grouse leaves the burrow with a whir of wings and a burst of snow, but if unmolested, I believe they ordinarily emerge on foot. Sometimes a grouse pokes its head up above the level without emerging, and occasionally openings thus made along one of their long burrows show that the bird several times took a look around.

In plunging to roost under the snow, grouse often barely miss striking rocks, limbs, and logs which are covered up. I have often

wondered why they do not more frequently strike such objects, with fatal results.

On sunny winter days the grouse sit in little groups and preen in the shelter of fallen tree tops, especially if these still retain their leaves. They often sit up in the balsam trees where, no doubt, the dark background tends to increase warmth.

When the snow is moist, thawing, or crusted, the grouse at Ladysmith were invariably to be found roosting either in the spruce swamp (in which I think some birds roosted habitually irrespective of weather conditions), or in a dense grove of balsams in the hardwood tract. On January 21, 1921, following several warm days with freezing nights which crusted the snow, I watched a group of Ruffed Grouse go to roost in these balsam trees.

Just before sundown I approached the grove and placed myself, back against a tree, under the thickest part of the grove. The trees were from fifteen to fifty feet in height. Under them the droppings had accumulated as if the spot were a chicken coop.

Very shortly I heard the wings of a grouse as it flew in, and soon saw the bird budding in a large-toother aspen. It was some time before others appeared, but they finally came, one by one, flying short distances from tree to tree, budding on each for a few moments.

One grouse flew to the ground, others following almost immediately. The sun was now down and the twilight advancing. Two of the birds walked toward me, their heads bobbing like pigeons. They seemed to inspect me and each, after taking several mouthfuls of snow, flew on noisy wings into the balsams, settling down not more than ten feet from me. I heard many soft and beautiful cooing notes for the first time, having never before appreciated the conversational vocabulary of these birds. The grouse squatted down on branches about eight feet above the ground and about two feet out from the trunks of the trees. I watched several of them go to roost in this manner and noted that each one ate snow before flying into the trees.

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IMPRESSIONS OF GRAND MANAN BIRD LIFE

BY OLIN SEWALL PETTINGILL, JR.

Grand Manan is one of those water-hugged bits of coastal terrain that has become, because of its bird life, a name permanently enshrined in the annals of ornithology. Like Cobb Island, Bird Rock, and Bonaventure, it has long been a "place to be seen" to many a bird enthusiast. John James Audubon visited Grand Manan and some of its outlying islands in 1833 and later wrote [1] of the great numbers of certain avian inhabitants. T. M. Brewer[2], Henry Bryant[3], Harold Herrick[4], and R. F. Pearsall[5] journeyed there and composed the first lists and ornithological accounts of the region. In recent years many ornithologists have included Grand Manan in their itineraries and, while not publishing extensive treatises on studies made there, have remarked in various natural history journals of the abundance of certain species and the unexpected appearances of birds beyond their normal range.

Grand Manan is an island which unhesitatingly appears out of the strong tides at the mouth of the Bay of Fundy. It lies directly off the coast of New Brunswick at its junction with Maine. Politically it is a part of Charlotte County, New Brunswick, and is approximately fifteen miles long and six miles in greatest width. Its particular scenic features are the bold northern and southern headlands, each adorned with shining white lighthouses; fjordlike Dark Harbour that breaks up the near-regularity of its western shore of otherwise red-colored, sheer two-hundred-foot cliffs; the low eastern coast notched by numerous snug harbors that are, in turn, surrounded by homelike villages of 2500 fisherfolk; outlying rock-ribbed, spruce-tufted islands; treacherous, tide-covered ledges; and cold thundering surf.

For so small an area—small, at least, beside the great continent that can be viewed from its western shore—Grand Manan has a remarkably long list of birds to its credit. This has been due not so much to the ornithologists who have visited it during the past fifty years as to the inspired work of two residents of the island, Mr. Allan L. Moses and his father, Mr. John R. Moses. Both keen observers and discriminating collectors, as well as skilled taxidermists, these two gentlemen have in their possession a collection of beautifully mounted birds. At the present time the younger Mr. Moses has these specimens

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[1] 1835. Ornithological Bibliography. Vol. III.
[2] 1852. Boston Journ. Nat. Hist. Vol. VI, pp. 297-308.
[3] 1857. Proc. Boston Soc. Nat. Hist. Vol. VI, pp. 114-123.
[4] 1873. Bull. Essex Inst. Vol. V, pp. 28-41.
[5] 1879. Forest and Stream. Vol. XIII, pp. 524-525.

on display in a small house set aside as a museum at the village of North Head. Already several well-known ornithologists have worked over this collection. Not only is the collection representative of the island but it also contains specimens that confirm numerous records for the area. Among the rarer birds to be seen are a Yellow-crowned Night Heron, Black Skimmer, Scissor-tailed Flycatcher, Black Tern, Marsh Wren (subsp.?), Chestnut-collared Longspur, Lark Bunting, two Lark Sparrows, Red-eyed Towhee, and Lapwing.

It is said that Grand Manan and fog are synonymous. It was only fitting, then, that my first near-view of Grand Manan should be through a vista of fog. This view I obtained on the morning of May 31, 1935, from the motorship "Grand Manan II" on which I was arriving with duffel and car. Faintly at first and then distinctly I saw the imposing cliffs of Seven Days' Work. In a few moments they were absorbed by the fog and Grand Manan was not seen again until the vibrating hull of the ship rounded Swallow Tail Light and nosed into North Head. My visit to Grand Manan continued until July 22, during which time I attempted to cover as much of the island as possible and to visit diversified habitats. I have Mr. Allan Moses to thank for placing me in touch with places frequented by species that I might have overlooked otherwise.

Faunistically Grand Manan is Canadian Zone of the C. Harte Merriam pattern. The central and western portions of the island are for the most part richly timbered with spruce, save on the outskirts where the trees become stunted. Numerous springs in the higher western region give rise to large alder-bordered streams which rush seaward along pebbled courses and sometimes filter through bogs of plushy moss and flowering shrubs. There is an ill-smelling salt marsh at Castalia that is gouged in typical fashion by tidal channels and stagnant sloughs. A few portions of the island's interior, where hardwoods occasionally predominate, are indicative of the Transition Zone, as are the vicinities of the villages where grass-covered fields, rocky pastures, and open marshlands occur.

From the very outset of my visit I could not fail to be impressed with the great abundance of certain species of land birds. The Robins and Crows were common in expected numbers as were the Cedar Waxwings, Savannah and White-throated Sparrows, and Slate-colored Juncos. But in no other region have I seen the Black-throated Green Warblers so common. During the first week of my visit I accounted for their conspicuous numbers by the fact that the migration wave was not yet over. Parula and Blackpoll Warblers were still common

FIG. 20. Yellow-bellied Flycatcher on its nest. Dark Harbour, July 5, 1935.

FIG. 21. Acadian Chickadee at the entrance to the nesting hole. Deep Cove, Grand Manan, July 18, 1935.

in areas where it seemed apparent they would not remain. But, by the end of June, the Black-throated Green Warblers were still ubiquitous in every type of wooded area whereas the Parulas were now scatteringly few and the Blackpolls had resorted to the exposed and stunted spruces at the northern and southern headlands. I found one nest of the Black-throated Green Warbler far up in a spruce in comparatively open country, another in a low hardwood shrub in deep woods, and observed young on two occasions in an extensive alder swale. Almost as impressive in numbers were the Redstarts, Nashville Warblers, Northern Yellowthroats, and Olive-backed Thrushes. Though requiring a more specialized type of tree association, their numbers were noticeable in areas where they existed.

About the villages the swallows unquestionably predominated in numbers. While these birds are known to frequent coastal regions in considerable numbers anyway, here man has both intentionally and unintentionally provided excellent nesting sites to further encourage this habit. The residents in the villages have taken an exceptional interest in providing small bird houses suitable for the Tree Swallows. At Seal Cove each door yard averaged five of these bird houses. Only a few were without them, while many possessed over a dozen. In one door yard I counted sixteen houses, nine of which were occupied. At a glance I believed some of the houses were not spaced far enough apart to allow each pair of birds ample territory and were not, in certain instances, placed high enough off the ground. The locations apparently made little difference. Two pairs occupied boxes scarcely six feet apart; one pair lived in a box five feet from the ground. The Barn Swallows have taken advantage of the peculiar structure of the fish smokehouses. In these buildings the apices of the roofs are open and covered with superimposed roofs. Through these openings the swallows gain admittance into the otherwise closed buildings and place their nests on the roof supports and fish racks. Unfortunately the smokehouses are so constructed as to allow scarcely any eaves. Thus the Cliff Swallows are deprived of the use of these buildings. Nevertheless, the species is present in numbers that would be expected in coastal communities, using the suitable eaves of barns and dwelling houses that are available. Where the sea has recently encroached upon the low-lying eastern shore of Grand Manan, the soil has been cut away leaving large gravel banks which seem especially suited to the nesting needs of the Bank Swallow. However, I found no more than a dozen pairs in all the available places. According to the residents of the island who live near these banks, the species has decreased

markedly during the last five years, once being a very common bird.

In spite of the abundance of some species, there were a few Canadian Zone birds whose presence I failed to note. I saw no Canada Jays and missed the Spruce Partridge and Tennessee Warbler. These species Mr. Allan Moses has never seen though he has been on the watch for them for many years. I noted but one Blue Jay. Other species that I expected to find common, such as the Brown Creepers, Pine Siskins, and Canada Warblers, were not observed.

No large family of birds was better represented on Grand Manan than were the flycatchers. Pairs of Kingbirds were frequently observed along the roadsides of the eastern side of the island. At Seal Cove I saw one Phoebe at intervals during the breeding season. On June 6 I heard two Wood Pewees on the road to Dark Harbour and from June 5 to June 17 I found the Olive-sided Flycatcher in different sections of the island. Since both the Wood Pewees and Olive-sided Flycatchers were not noted again as the season advanced, they were apparently on migration. On June 13 Mr. Allan Moses collected the first Least Flycatcher he had ever seen on Grand Manan. I saw another on July 2. Nearly every cluster of alders of any size was found inhabited by at least one pair of Alder Flycatchers. In the deep woods of the central and western portion of Grand Manan I sometimes noted the Yellow-bellied Flycatcher. I found a nest of the species in the process of construction on June 8 and followed it through the season until the young left the nest on July 13.

This habitat of the Yellow-bellied Flycatcher was typical of the richly wooded area of Grand Manan. Huge yellow birches and thickly growing spruces darkened the forest floor of cool moss. Lichens bearded the decaying stumps and rotting underbrush. Almost beside the Yellow-bellied Flycatcher nest that was hidden beneath a maple root, a spring-fed rivulet trickled over a leaf-soaked bed. From the nest side I recorded at one time or another, the following species: Black-throated Blue Warbler, Black and White Warbler, Winter Wren, Redstart, Parula Warbler, Oven-bird, Red-eyed Vireo, Golden-crowned Kinglet, Black-throated Green Warbler, and Bay-breasted Warbler.

Both the Black-capped Chickadee and Acadian Chickadee were on Grand Manan in almost equal numbers. Most of my attention was directed to the more northern form since it was a species entirely new to me. A study of it soon proved to my own mind that it was not unlike its darker relative in habits. The first nest that I found contained six well-grown young. In an attempt to find out if this species was capable of feeding its young as many times as the Black-capped

Chickadee has been found to do, a continuous all day observation was made at the nest side. The pair fed their young 365 times during the day. Between 6 o'clock and 7 o'clock in the morning they fed their young thirty-nine times. No observation blinds were necessary as they permitted the onlooker to stand directly beside their nest while they carried on their feeding.

On Grand Manan's extensive salt marsh at Castalia I found nesting approximately a dozen pairs of Acadian Sparrows. I noted as many as four males singing in the air at one time. Each began his flight performance by rushing several feet skyward, and then sailed abruptly earthward, giving, during the descent, a suggestion of a song, though it resembled more the sizzling sound made when a cap is slowly removed from a bottle of ginger ale. A severe rain accompanied by strong northeast winds caused the marsh to be flooded during the middle of June by excessive high tides. A visit here two days after the disaster revealed that three nests of this species and several of the Savannah Sparrow had been completely washed out, the eggs appearing in the grass, some of them broken, others intact. Probably all of the nests in the marsh were wiped out at this time.

The predatory birds seemed to be comparatively few at Grand Manan. Of the hawks, only the Marsh Hawk was frequently seen. These birds apparently nest in some of the isolated bogs of the island's interior. Two nests of the year were reported to me and I found a last year's nest near Little Pond. I observed the Sharp-shinned Hawk twice, and the Osprey ten times, finding a nest of the latter at Miller's Pond. I discovered the nesting locality of a pair of Sparrow Hawks and found a nest of the Broad-winged Hawk.

Occasionally a few Ravens were seen moving along the shores. At Deep Cove a nest of a white domestic duck was robbed twice by Ravens during the course of the season. One pair of Ravens nested earlier in the season on Outer Wood Island and another pair at Southern Head. Both nests were destroyed by human hands before the eggs hatched.

It was particularly gratifying to find Grand Manan a region where I could safely call the Woodcock common. On the first evening of my visit I walked along the road at Deep Cove which runs along beside the ocean and counted ten birds going through their flight songs. These sounds already familiar to me, when mingled with the rush of the surf, presented a strange new combination of beauty. Subsequent trips through the numerous marshy alder-covered swales and even in the thick forests were usually featured by flushing at least one, some-

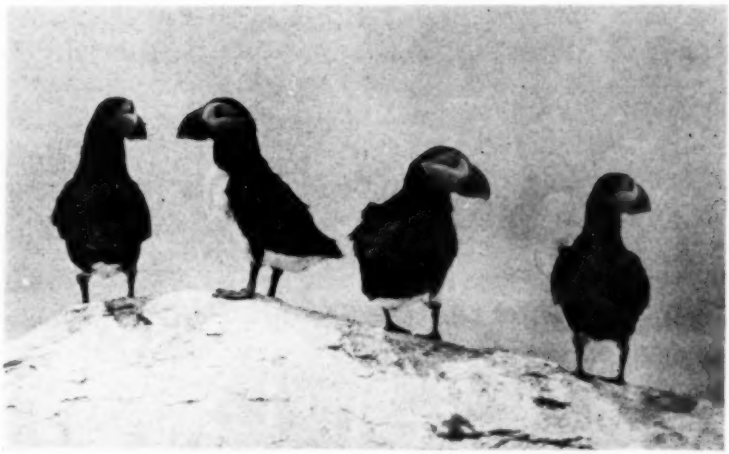

FIG. 22. Atlantic Puffins on their nesting grounds at Machias Seal Island, July, 1932.

FIG. 23. Black Guillemot hesitating a few seconds after emerging from its nest located in the crevices in the rocks. Kent's Island, July 11, 1935.

times as many as five birds. Five broods were reported to me during the season.

It is probably the diversity of sea birds on the outlying islands that brings Grand Manan its particular distinction ornithologically. American Eiders nest on Three Islands and Little Wood Island. It has been estimated by the Bowdoin Biological Station located on Kent's Island (one of the Three Islands) that approximately 250 pairs nest here. On several islands are colonies of the Black Guillemot totaling about 430 pairs. Of the burrows of the Leach's Petrel, approximately 27,500 have been counted. A few Great Black-backed Gulls nest on Three Islands and Little Wood Island, undoubtedly no more than twenty-five pairs. The Herring Gull population of all of these islands is estimated at 22,500 pairs. On the Yellow Murre Ledge nest 100 pairs of the Razor-billed Auk.

Fifteen miles to the south of Grand Manan lies Machias Seal Island—the southernmost breeding ground of the Atlantic Puffin. In a visit made here in 1932, I estimated 400 pairs of birds. In 1935 I believed the numbers to be the same. From reports made in ornithological journals, it would appear that the numbers have remained almost constant for at least twenty years. In addition to the puffins, there are over 2,000 pairs of Arctic Terns, 50 pairs of Common Terns, and 2,000 burrows of Leach's Petrel.

That many of these islands are overpopulated with Herring Gulls, there can be no question. In fact, I saw several instances where I believed individuals were forced to seek nesting sites not used in previous years. On the ledge directly off the shore of Machias Seal Island, where formerly only terns were known to nest, six Herring Gull nests were built. On the Castalia marshes I observed two Herring Gulls that protested my presence vociferously whenever I approached within a certain area. From their behavior I believed this area to be selected nesting territory, though no nests nor eggs could be found. Mr. Allan Moses has never known the Herring Gulls to nest here. On Nantucket Island Mr. Moses and I estimated approximately 250 pairs of birds. During the previous breeding season Mr. Moses estimated the pairs nesting there to be under a hundred. Only the Machias Seal Island could I foresee any serious effect of the Herring Gulls on the other bird life. Here, unless the species is checked, the terns will be driven away. This seems deplorable as the island constitutes the only nesting colony of the Arctic and Common Tern in the vicinity of Grand Manan.

For a greater diversity of bird life, one could not ask for a better place than Grand Manan and the islands in its immediate vicinity. Probably there are no new forms to be discovered here. Nearly all the birds occurring in Northeastern North America have at some time or another been recorded. Nevertheless, Grand Manan has still many opportunities to offer ornithologists desiring to make field studies of particular species. There are birds in abundance and there are the facilities of the Bowdoin Biological Station on Kent's Island—a place we strongly hope will soon become a Barro Colorado or Tortugas of the Northeastern Atlantic coast.

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NOTES ON THE SUMMER AND FALL BIRDS OF THE WHITE MOUNTAINS, ARIZONA

BY LAURENCE M. HUEY

Between June 23 and July 24, 1933, a party representing the San Diego Society of Natural History collected birds and mammals in the White Mountains, Apache County, Arizona. The personnel comprised Karl Kenyon, Turlington Harvey III, Samuel G. Harter, and the writer. The writer later returned during his vacation and spent from September 28 to October 5, 1933, in the same locality. Following is a list, with notations, of the birds collected or observed, with a brief description of this interesting region.

The White Mountains are situated near the center of the eastern boundary of Arizona and form the highest part of the eastern end of the great Mogollon Plateau. Our summer camp was situated on the north fork of the White River, at an altitude of 8200 feet, and from this point we radiated on foot in all directions for a distance of three or four miles. On three occasions, by machine and on horse-back, greater distances and higher elevations were reached.

The rushing mountain stream that passed our camp-site—often referred to as "the creek"—ran in an east to west direction and was bordered with birches, alders, and low willows. To the south, Mount Ord and Mount Baldy rose to elevations of over 10,000 feet. During our summer visit, each retained a low bank of winter's snow on the north slope of their crests. A dense forest of spruce clothed these northerly slopes, and where fires had burned through this forest, pure stands of aspen had filled in. To the north of the river, the country was a gentle sloping plateau, chiefly forested with yellow pines. Grassy

prairies, void of trees, occupied parts of this plateau, and occasionally moist glades formed small meadows in the forests. The whole region visible from our camp had never been logged and was indeed a forest primeval, beautiful to see.

The Transition Zone, marked by the yellow pine forests, and the Hudsonian Zone, indicated by the spruces, were sharply defined. In our location, the river formed the boundary of each, and but few were the spots where the pines invaded the spruce territory south of the stream or vice versa.

The whole collecting area was within the Fort Apache Indian Reservation and the wild life had not been destroyed. Hunting for sport by any person except the resident Indians was prohibited. Bears, both black and grizzly, and a few wolves still roamed unmolested; turkeys and grouse were fairly abundant.

In former years sheep had been allowed on the higher elevations, but following the cessation of such grazing the response by nature seemed almost beyond belief. Grass was almost knee high over the more open parts of the Hudsonian Zone, while the forest meadows were waist deep in grass and flowers. A few cattle roamed over the prairies and through the yellow pine forests, but were so limited in numbers that the meadows and grassy parts of this zone were but little affected. The nearest settlement and postoffice was the small lumber-mill town of McNary, about eleven miles away, at an elevation of 7200 feet.

The writer wishes to express his thanks to the Arizona Fish and Game Commission for many courtesies extended; to Mr. William Donner, Superintendent of the Fort Apache Indian Reservation for his kindness in granting our party collecting privileges within the Reservation; to Mr. Hughey, the local game protector, whose knowledge of the region and its wild life proved to be very helpful many times; and to Mr. A. J. van Rossem and Mr. A. C. Bent, who aided in the identification of some of the specimens taken.

Pied-billed Grebe. *Podilymbus podiceps podiceps.* A pair of Pied-billed Grebes was seen swimming on the mill-pond at McNary on June 23, and on July 23 probably the same pair was seen with six small young.

Treganza's Heron. *Ardea herodias treganzai.* A single Great Blue Heron was seen several times as it fished along the stream during my stay between September 28 and October 5.

Common Mallard. *Anas platyrhynchos platyrhynchos.* A newly hatched duckling of uncertain identity was brought in by Kenyon on

FIG. 24. A spruce forest, with Mt. Ord in the distance.

FIG. 25. A mountain meadow filled with blooming iris. Yellow pines are in the foreground and background.

June 26. It was found with its mother a mile or more up White River from our camp, at an altitude of about 8300 feet. He tried to raise it but it died on June 28. Subsequently it was forwarded to Mr. A. C. Bent who identified it as a Mallard.

A few days later the local game warden, Mr. Hughey, took us to a place where he had flushed a Mallard from its nest which contained eight eggs. Unfortunately, the nest had been destroyed by some enemy, as only a few scattered egg-shells remained. The nest was under the grass at the roots of a scrub willow near the rushing creek.

Sharp-shinned Hawk. *Accipiter velox velox.* A molting female was taken on July 11 which upon dissection offered no indication of having nested. The bird was just emerging from immature into adult plumage. Barred breast feathers were replacing streaked, and on the back the new feathers were bluish instead of brownish. From this evidence it might seem that this bird was summering in its birthplace or possibly its future nesting region.

Western Red-tailed Hawk. *Buteo borealis calurus.* A single immature hawk of this species was living along the creek and seen almost daily during my fall visit.

Ferruginous Rough-leg. *Buteo regalis.* A pair of these hawks was seen several times in July during our summer visit, and on October 4 the writer saw one perched on a fence-post at very close range.

Golden Eagle. *Aquila chrysaëtos canadensis.* A pair of Golden Eagles was seen several times flying over the spruce forest at Bear Flat near Mount Ord. Once, while the writer was on horse-back, one of the pair flew very closely over head.

Eastern Sparrow Hawk. *Falco sparverius sparverius.* At least two pairs of Sparrow Hawks had chosen the forests bordering the large open prairies for their summer homes. They were exceptionally wild and only one specimen was obtained.

Dusky Grouse. *Dendragapus obscurus obscurus.* Dusky Grouse were not uncommon in the summer on the higher wooded ridges, where they were nesting. Three families of half-grown young were found during July by members of our party. They were accompanied by the female parents only; the males were not seen.

Merriam's Turkey. *Meleagris gallopavo merriami.* Turkeys were fairly common and were seen during both the summer and fall visits.

Virginia Rail. *Rallus limicola limicola.* The voices of Virginia Rails, emanating from a large marsh, were heard many times during the latter part of June and early July. However, in many attempts we

failed to secure a specimen, though the presence of the birds was beyond question.

American Coot. *Fulica americana americana.* Several pairs of Coots were nesting in the tules that bordered the mill-pond at McNary and were seen each time we passed the place during our summer's stay.

Spotted Sandpiper. *Actitis macularia.* A single individual was seen several times when it was flushed from the creek bank during my fall visit.

Western Mourning Dove. *Zenaidura macroura marginella.* A pair of Mourning Doves was seen and heard near our camp on July 5 and 6, and were the only birds of this species recorded during either visit.

Western Horned Owl. *Bubo virginianus pallescens.* The hooting of Horned Owls was heard almost every night during our stay in June and July, and also during the fall visits. One specimen, an adult male, was secured on June 29.

Western Nighthawk. *Chordeiles minor henryi.* Several times during our stay Nighthawks assembled about sundown in loose flocks to feed high over the yellow pine forest. The only opportunity to obtain a specimen came on July 9 when a female and two downy young were taken on an open grassy prairie.

Broad-tailed Hummingbird. *Selasphorus platycercus platycercus.* This bird was not common and was the only species of hummingbird found by our party in the White Mountains. A nest with one fresh egg was taken on July 19. It was situated on a dead twig of a fir tree, twenty feet above the ground in an open forest.

Western Belted Kingfisher. *Megaceryle alcyon caurina.* Two Kingfishers were living along the stream while I was there during the fall.

Red-shafted Flicker. *Colaptes cafer collaris.* Flickers were found in about equal numbers amidst the pines and spruces and were not uncommon. A young bird that had recently left the nest was taken on July 14.

Mearns's Woodpecker. *Balanosphyra formicivora aculeata.* These birds were seen commonly about McNary, where they were resident in the oak belt.

Red-naped Sapsucker. *Sphyrapicus varius nuchalis.* Three adult specimens in breeding condition were taken during our summer stay. This species was rather common as a migrant during the fall visit.

Natalie's Sapsucker. *Sphyrapicus thyroideus nataliae.* This was the commonest member of the woodpecker family and was found most abundantly through the yellow pine forest. Young birds just out of the nest were taken July 4.

White-breasted Woodpecker. *Dryobates villosus leucothorectis.* This form of Hairy Woodpecker was found sparingly through the yellow pine forest. A young male specimen, that had recently left its nest, was collected July 13.

Alpine Three-toed Woodpecker. *Picoides tridactylus dorsalis.* Of four specimens collected, three were secured in the yellow pines bordering the spruce forest, where no doubt they were foraging. The fourth, taken on July 9, was shot in the dense spruce forest on Snake Creek, a tributary of the White River, at 8500 feet altitude. This bird, a female, was in incubating condition.

Wright's Flycatcher. *Empidonax wrighti.* On July 22, Harter collected a female of this species and four partly-feathered young. The latter he took from their nest, which was situated five feet above the ground in a slender willow tree near a stream. On July 20, he had collected the male from the near vicinity. This was the only time this bird was found by our party.

Western Flycatcher. *Empidonax difficilis difficilis.* This species was fairly common during our summer stay. Several nests were collected and several found with young. In every case they were situated in a niche of a vertical rock wall or creek bank and on the shady, northerly side.

Western Wood Pewee. *Myiochanes richardsoni richardsoni.* This was the most common flycatcher found in the region. Their greatest abundance was in the yellow pines near the water courses and open glades.

Olive-sided Flycatcher. *Nuttallornis mesoleucus.* These large flycatchers were nesting commonly in the yellow pines, their lusty calls of "*It's me' here*" being heard almost every quiet morning during the first part of our stay. The habit of these birds of building their nests high up in the trees and perching on the very tip tops of the tallest pines was responsible for their being more often heard than seen.

Montezuma Horned Lark. *Otocoris alpestris occidentalis.* Horned Larks were abundant on the large open grassy prairies. Young on the wing and a set of three fresh eggs were taken on July 9.

Violet-green Swallow. *Tachycineta thalassina lepida.* This swallow was fairly common in the yellow pine forests and small colo-

nies were to be found nesting in dead stubs, where they were conveniently situated near marshes or meadows that offered good feeding grounds.

Purple Martin. *Progne subis subis.* A colony of five or six pairs was nesting in two dead pine trees at an elevation of about 8600 feet in the Hudsonian Zone and another small colony was found on the outskirts of the town of McNary.

Rocky Mountain Jay. *Perisoreus canadensis capitalis.* These shy birds were not common. Of five specimens taken four were found in the yellow pines, almost at the point of contact with the spruce forest. The fifth, a male, was taken on July 17 at Bear Flat (altitude 9000 feet) in a dense spruce forest. This bird was carrying a beakfull of insects when shot.

Long-crested Jay. *Cyanocitta stelleri diademata.* This noisy jay was common. A short-tailed youngster, just out of the nest, was taken on July 8.

Western Crow. *Corvus brachyrhynchos hesperis.* A flock of several hundred crows had assembled for the summer on a large high prairie, two miles east of our camp, at about 8500 feet elevation. One specimen was secured on July 9.

Clark's Nutcracker. *Nucifraga columbiana.* On July 21, Harter shot a pair of these birds in the pines near camp. They were the only nutcrackers seen by our party, but the species was said to be irregularly common by the resident game warden.

Mountain Chickadee. *Penthestes gambeli gambeli.* Chickadees were most often found along the water courses, where they were feeding in the birches. An incubating female was collected on July 3 and a young bird in full feather on July 19.

Rocky Mountain Nuthatch. *Sitta carolinensis nelsoni.* This larger nuthatch was found twice, a single specimen being collected on July 22, and another one seen the day following. The bird collected was in very worn plumage and had no doubt ascended from the oak belt found at lower altitudes on the White Mountains.

Black-eared Nuthatch. *Sitta pygmaea melanotis.* These diminutive nuthatches were common in the yellow pines and family bands were found many times feeding high in the tall trees. A young bird that had but recently left the nest was taken on July 14.

Red-breasted Nuthatch. *Sitta canadensis.* This species was not found during the summer visit, though more work in the spruce for-

ests would probably have determined its presence. However, two specimens were taken in the fall, one on September 29 and the other on October 1.

Rocky Mountain Creeper. *Certhia familiaris montana.* Creepers were not uncommon through the yellow pine forests and were probably more abundant than the four specimens taken would indicate.

Dipper. *Cinclus mexicanus unicolor.* Water Ouzels were found along the larger streams. The only specimen obtained was a young bird taken on July 4. On July 9, the writer found a nest containing four small young. When the nest was approached, a parent bird was flushed and, uttering its alarm note, was soon joined by the mate. Both birds were unusually tame and scolded constantly while I was near the nest.

Western House Wren. *Troglodytes aedon parkmani.* House Wrens were fairly common along the contact between the yellow pine association and the spruce. A young bird that had recently left its nest was collected on July 22. House Wrens were still to be found among the birches near the creeks during the last days of September and the first of October.

Common Rock Wren. *Salpinctes obsoletus obsoletus.* Rock Wrens were not common as the region was not suited to their needs. An occasional bird was seen near Snake Creek, where there were several rock-bound canyons.

Western Robin. *Turdus migratorius propinquus.* Robins were breeding commonly along the water courses. Young out of the nests were seen and one collected on July 1. A set of four heavily incubated eggs was collected on July 22. During my fall visit but a single specimen was seen and collected on September 28. At this time the entire Robin population had left for other localities nor were they seen at McNary, at an altitude of 7200 feet, during two visits to the town.

Audubon's Hermit Thrush. *Hylocichla guttata auduboni.* Hermit Thrushes were found sparingly along the water courses. A nest containing four eggs was found on June 24. It was situated six feet above the ground in a small spruce tree near the creek. The incubating bird was shot and upon dissection proved to be the male of the pair. Another set of four very heavily incubated eggs was taken on July 24.

Mountain Bluebird. *Sialia currucoides.* Mountain Bluebirds were found about the pine-bordered prairies. They were not abundant

FIG. 26. Nest and eggs of the Red-backed Junco.

FIG. 27. Nest and eggs of the Lincoln's Sparrow.

and, as elsewhere over their range, lived in open, dry, high transition localities.

Townsend's Solitaire. *Myadestes townsendi.* Solitaires were fairly common. Three pairs were found July 1 with young on the wing. Their old nests were located nearby, situated in niches of low perpendicular cliffs that bordered a small stream. Both wood rats (*Neotoma*) and chipmunks (*Eutamias*) were common about these rocky cliffs, and apparently the smooth surfaces of these sheer walls prevented the mammals from molesting the nests.

Western Golden-crowned Kinglet. *Regulus satrapa olivaceus.* Three specimens, two adult and one young, were taken on July 17, at an altitude of 9000 feet, in the spruce forest bordering the beautiful mountain park called Bear Flat, thus adding another record of this bird as a breeding species in Arizona.

Eastern Ruby-crowned Kinglet. *Corthylio calendula calendula.* These diminutive birds were found where the forests mixed and at a lower elevation. They were not rare and several families of young out of the nest were seen during July. At this time the almost incessant nuptial songs of the males had ceased and their presence was not as obvious as it would have been earlier in the season.

Plumbeous Vireo. *Vireo solitarius plumbeus.* An immature female of this race was taken at McNary on October 3.

Cassin's Vireo. *Vireo solitarius cassini.* A male specimen of this race was taken at the north fork of White River, 8400 feet altitude, during migration on September 29.

Western Warbling Vireo. *Vireo gilvus swainsoni.* It was with some surprise that the scarcity of this usually common bird was noted. In the writer's experience, aspen groves in the proximity of meadows and streams always harbor a goodly population of this species, but two adults and one young secured during July were the only specimens heard or taken. The adults were in breeding condition and the young one was not long out of the nest.

Virginia's Warbler. *Vermivora virginiae.* This rather quiet, diminutive bird may have been more common than the specimens collected would indicate. Two immature birds, one taken on July 2 and the other on July 17, proved the species to be nesting in this locality. Their choice of tall yellow pines as a feeding ground was no doubt the reason for their apparent scarcity.

Black-fronted Warbler. *Dendroica auduboni nigrifrons.* Comparison of the good series of breeding birds which we secured in the

White Mountains with Pacific Coast birds, and also with birds taken in the mountains of southern Arizona reveals the fact that the name *nigrifrons* should be applied to all breeding *D. auduboni* of Arizona.

MacGillivray's Warbler. *Oporornis tolmiei.* A few pairs of this species were found during our summer stay in a small area of dense scrub willows and birches growing near the creek. The three adult birds collected were all in breeding condition.

Lilian's Meadowlark. *Sturnella magna lilianae.** A few pairs of Meadowlarks were nesting on the large prairies. A single male specimen in breeding condition was collected July 9.

Nevada Red-winged Blackbird. *Agelaius phoeniceus nevadensis.* Two small colonies of red-wings were found. One colony was nesting in the tules growing in a mill-pond at McNary, and a smaller colony was nesting in the tall grass of a boggy meadow near our camp. By the latter part of July the young had taken wing and the whole population had left the region.

Brewer's Blackbird. *Euphagus cyanocephalus.* A small group of blackbirds lived about the village of McNary and another was seen and two immature specimens collected July 9 on the prairie near Snake Creek.

Western Tanager. *Piranga ludoviciana.* The three-note call of the Western Tanager was not uncommon and the species was well distributed over the whole area explored.

Western Evening Grosbeak. *Hesperiphona vespertina brooksi.* Two Evening Grosbeaks collected by Harter on the same day, July 21, proved to represent two races. When dissected neither bird was found to be in breeding condition. As both were in the midst of molting, it would indicate that their nesting period had passed and that they were migrating in search of a better food supply.

Mexican Evening Grosbeak. *Hesperiphona vespertina montana.* As recorded under the preceding form, a single specimen of this subspecies was taken on July 21.

Northern Pine Siskin. *Spinus pinus pinus.* During the summer, siskins were found where the pines bordered dry grassy flats. At the time of the fall visit, they had assembled in large flocks and were found feeding in weed patches by the roadside.

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*Proposed by H. C. Oberholser (Sci. Pub. Cleveland Mus. Nat. Hist., I, No. 4, p. 103, December, 1930) with a range of: Central western Texas and southwestern New Mexico, west to central and southern Arizona, south into Sonora and Chihuahua.

Mexican Crossbill. *Loxia curvirostra stricklandi.* These birds were heard more often than seen, as their peculiar, sharp, chattering notes attracted our attention during the latter part of our summer stay. No evidence of breeding was shown in the three specimens collected.

Green-tailed Towhee. *Oberholseria chlorura.* Green-tailed Towhees were not common and the first one of four specimens taken was caught in a mouse trap set amidst the rather dense shrubbery bordering White River. This bird, a female, showed unmistakable signs of incubating, though a search failed to reveal the nest. Later, on July 19, a member of our party found a nest containing two eggs. This nest was left undisturbed for the bird to complete the set, but was destroyed by a severe hail storm the next day. I believe that hitherto there has been no actual record of a nest of this species in Arizona, though it has been recognized as a summer resident.

Western Vesper Sparrow. *Pooecetes gramineus confinis.* Vesper Sparrows were abundant on all the larger grass-covered prairies. Young birds just out of the nest were seen on July 16.

Red-backed Junco. *Junco phaeonotus dorsalis.* This bird was fairly common, mainly along the stream courses. The greatest abundance was in the yellow pine area, though they were to be found scattered along the streams some distance into the fir-spruce forests. Nesting dates were irregular, as young on the wing were taken July 8 and a set of four eggs was taken July 19. This nest was found in the course of construction on July 7 and was situated on the ground under a tussock of grass near a small stream.

Western Chipping Sparrow. *Spizella passerina arizonae.* Chipping Sparrows were more abundant at lower elevations, where open pine forests and grassy glades occurred. Only one bird was taken at our White River camp, a male, in breeding condition, on June 23.

Gambel's Sparrow. *Zonotrichia leucophrys gambeli.* A specimen was taken from a small migrating flock on October 1.

Lincoln's Sparrow. *Melospiza lincolni lincolni.* These birds were fairly common and were found on nearly every wet meadow in the Hudsonian Zone that we explored. Young birds just out of the nest were taken on July 6 and a set of four fresh eggs was found on July 23.

San Diego Society of Natural History,
San Diego, California.

GENERAL NOTES

Conducted by M. H. Swenk

Woodcock and Whistling Swan in Iowa.—On March 26, 1936, I flushed an American Woodcock (*Philohela minor*) in the Backbone Park, Delaware County, Iowa. On the following day I noted seven Whistling Swans (*Cygnus columbianus*) on Swan Lake, in Johnson County, Iowa. Mr. E. B. Speaker, Field Supervisor of Fisheries, was with me on both occasions and also noted these birds. We took pictures of these birds observed in Johnson county.—W. W. Aitken, *Iowa Conservation Commission, Des Moines, Iowa.*

The Mute Swan and European Widgeon in Ohio.—A Mute Swan (*Sthenelides olor*) was observed by Mrs. Skaggs and the writer at Gordon Park in a small area of open water in Lake Erie on January 26, 1936. The bird was with a number of Lesser Scaups and was about 150 feet from the observers. Since this species has established itself in the East in a wild state, the bird may have been one of that type. No escapes have been reported from this region. Dr. S. C. Kendeigh also saw the swan, but it was in flight and he did not get to see the bill, so took it for a Whistling Swan.

On March 28, 1936, several members of the Cleveland Bird Club, including the writer, saw an European Widgeon (*Mareca penelope*) on the lake of the Sherwin estate, near Willoughby, Ohio. The bird was observed under perfect conditions and was a male in good plumage. Mrs. Sherwin saw the bird first on March 26. On March 29 it was not to be found. There are very few records for this bird in Ohio.—Merit B. Skaggs, *Cleveland, Ohio.*

Do Herons Use Their Beaks as Spears?—In the March, 1936, number of the Wilson Bulletin is an article on "Bird Life in Green Bay", by L. E. Hunter of Dallas City, Illinois, in which he says the Great Blue Heron (*Ardea herodias*) stabs fish with its bill. I wonder if this can be proved. I once found a Black-crowned Night Heron (*Nycticorax nycticorax hoactli*) with a broken wing. It shrieked fiercely and struck at my dog with open beak, and all the feathers raised on its neck. I called the dog off and it remained perfectly quiet while I picked it up and carried it some distance, but on seeing the dog, it again showed fight and struck at my throat. Luckily for me it did not strike spear fashion, but with open beak, making two scratches about an inch long, one on each side of my throat. It was a young bird in the immature plumage. But in the days of falconry, herons were supposed to be more or less dangerous to the attacking hawks and naturally one would suppose this meant using the bill as a spear.—William P. Hainsworth, *North Andover, Mass.*

The Harris's Sparrow in East-Central Illinois.—In the paper on the Harris's Sparrow (*Zonotrichia querula*) by Myron H. Swenk and O. A. Stevens, published in the September, 1929, number of the Wilson Bulletin, it is indicated that in Illinois, except in the southeastern portion, this sparrow occurs fairly regularly, especially in the vicinity of Lake Michigan. However, in the east-central portion of the state, in the vicinity of Champaign and Urbana, it has been noted but eight times in the last quarter century. Of these records, the greater number fall in April and May, and in October, as would be expected. It was my pleasure to record this bird for the first time at Mahomet, Champaign County, Illinois, on March 3, 1936. There are other March records for Illinois, although they are few in number, as mentioned in the above paper. The bird

was not collected, but the observation was made under such conditions of light and distance that no error is possible. Of added interest is the fact that the bird evidently was one hatched last summer, for it still retained the plumage characteristic of such birds when seen passing through during the fall migration. The chin and throat were white, and the breast was marked with a horizontal band of black streaks and blotches. The "pink" or reddish bill was quite distinctive.—C. T. Black, *University of Illinois, Urbana, Ill.*

The Snow Bunting in South Dakota.—The occurrence and distribution of the Snow Bunting (*Plectrophenax n. nivalis*) in South Dakota is not thoroughly established. At present it is classified as a winter visitor. It is not readily studied, as it occurs irregularly in flocks, usually during or following a severe snow storm accompanied by low temperatures. Then, too, it is often confused by the casual observer with Hoyt's Horned Lark, also a winter visitor. However, the Snow Bunting is more plump and at a distance displays more white on the belly.

Records of its occurrence are more common for the east half of the state than for the west. S. S. Visher (Wilson Bulletin, June, 1915) says for South Dakota, "common some winters; others rare." Norman Wood (*A Preliminary Survey of Bird Life of North Dakota*, 1923) says, "winter resident some years." Adrian Larson (Wilson Bulletin, March, 1925) says for South Dakota, "irregular winter visitor." These records apply to the eastern half of their respective states.

During the past winter (1935-36) it was recorded from the western part of the state. The writer has observed it many times in flocks of various numbers during cold days, either flying or feeding in weed patches or in plowed fields where snow had blown off. About 1915 a flock was seen feeding around elevators at Vermillion. In the Museum bird skin collection there are four from Hutchinson County, taken during the winter of 1901; one from Miner County, 1899, and three from Sanborn County, 1915.—W. H. Over, *University Museum, Vermillion, S. Dak.*

Bird Notes from Oklahoma.—The following sight records were made in Oklahoma during 1935. Reference to the *Birds of Oklahoma* by M. M. Nice (1931, revised edition) leads me to the belief that species herein mentioned are rare or uncommon in Oklahoma. For that reason, these notes are of some interest.

Lesser Snow Goose (*Chen h. hyperboreus*) and Blue Goose (*Chen caerulescens*). A flock of thirty Lesser Snow Geese and two Blue Geese was seen at Ponca Lake, Ponca City, April 15. The birds were fed grain by city park patrolmen and remained in the vicinity until April 24.

Osprey (*Pandion haliaetus carolinensis*). One bird observed flying over Lake Spavinaw, Mayes County, September 20.

Florida Gallinule (*Gallinula chloropus cachinanns*). One bird seen April 29 at Crystal Lake within the city of Woodward, Woodward County.

Dowitcher (*Limnodromus griseus* subsp.). A Dowitcher was observed in a rain-filled ditch ten miles north of Perry, Noble County, on April 15. Three others were seen October 6 on the west shore of Lake Overholser, Canadian County.

Sanderling (*Crocethia alba*). I noticed a flock of fourteen birds on a mud flat in the North Canadian River at Woodward, April 29.

Avocet (*Recurvirostra americana*). Two were seen April 15 beside a rain pool on U. S. Highway 77, eight miles north of Perry.

Caspian Tern (*Hydroprogne caspia imperator*). A large tern, most likely this species, was watched as it dived for fish while flying over Lake Spavinaw, September 20.

Common Tern (*Sterna h. hirundo*). Six were seen on April 29 at Crystal Lake, Woodward.

Canyon Wren (*Catherpes mexicanus conspersus*). Recorded by Mrs. Nice as "summer resident in the Wichita Mountains (Comanche County) and Cimarron County." Several were seen and heard on June 18 and August 28 in the Quartz Mountains, Greer and Kiowa Counties and no doubt the species nests in that locality.—James Stevenson, *Oklahoma City, Okla.*

Sex Ratio of English Sparrows.—After hearing Dr. L. J. Cole at the meeting of the Wilson Ornithological Club at St. Louis speak on the sex ratio of English Sparrow nestlings, my own records from 1932 to 1935 were reviewed, with the following results:

Month	Male	Female	Undetermined
January	13	0	0
February	6	6	0
March	7	19	0
April	7	25	0
May	3	35	22
June	1	1	33
September	14	24	0
October	26	37	0
November	12	14	0
December	37	20	0
Total	126	181	55

These figures include both young and old birds caught in traps used for banding purposes. Eighty-five of the birds were dissected for sex determination and other studies. The ratio of birds caught in different seasons shows a tendency similar to that of the Cardinal. More males enter traps during winter months and more females during nesting seasons.—Cora Shoop, *Steelville, Mo.*

The Field Characters of the Black-bellied and Golden Plovers.—Mr. Bayard H. Christy, an able and informative writer, made an inexplicable slip in his "Beach Combers" in the December, 1935, issue of the Wilson Bulletin that will surely cause confusion in the minds of some of his readers. On page 268 he stated, while discussing field marks of the Black-bellied and the Golden Plovers, that the "only sure field mark is the hind toe—its presence or its absence"—and this after having noted the "broadly white and outspread wings and tail" of the Black-bellied Plover then under observation. According to the best descriptions available, the light stripe in the open wing and the white or whitish tail are amply sufficient to distinguish the Black-bellied from the Golden Plover in straightaway flight. In a side view in flight of a bird in immature or winter plumage, the black axillars (showing a black spot under the wing close up against the body) form a conspicuous field mark of the Black-bellied that is absent in the Golden. So much for actual markings. But anyone really familiar with the Black-bellied Plover in any plumage need never fear that he will overlook a Golden Plover. The Golden is a totally different bird—slimmer, more shapely, with a smaller head, and decidedly brownish in its "gray" plumage.

I had seen thousands of Black-bellied Plovers before I ever saw a Golden Plover, and I always had the beginner's fear that Golden Plovers might be passing me unnoticed. But my first Golden Plover stood out as something distinctly different, and I knew from the first glimpse that I was looking at no Black-bellied Plover. Of course, I checked my identification by flushing the bird and noting the dark tail and wings and the lack of black axillars, but that was merely a precautionary measure. Later experience with the Golden Plover has strengthened my first impression, that it resembles the Black-bellied Plover only in size and in family characteristics and that it is as distinctly different from it in the field as the Least Sandpiper is from the Semipalmated Sandpiper.—Francis M. Weston, *U. S. Naval Station, Pensacola, Fla.*

Field Marks of the Blue-winged Teal.—Nearly all artists who paint wildlife depict the Blue-winged Teal (*Querquedula discors*) differently than I have observed it. Because the difference is so marked, I should like to present the bird as I have seen it. This study was made on twenty-three lakes and sloughs in southern Minnesota, beginning June 24, and ending October 30, 1935. Blue-winged Teals stayed unusually late in southern Minnesota in 1935. Five of these sloughs were visited every week and the balance every second week throughout this period. All observations were made with a pair of 6x25 Victory Stereo Bausch & Lomb binoculars. A total of ten specimens was collected, and hundreds of birds studied carefully at close range.

When the Blue-winged Teal swims, rests on land, or walks, no trace is visible of the blue which covers the middle and lesser wing coverts. This blue is conspicuous in flight at all seasons but is never shown when the bird is at rest. This coloration is completely concealed by the long scapulars under which the bend of the wing is carefully tucked. Neither is the speculum visible. Occasionally, as a bird folds its wings after alighting or preening, a stray blue feather will show for a moment, but invariably the bird will readjust its wings and the blue is at once completely concealed. Near St. James on the morning of October 22, 1935, I watched ten Blue-winged Teals from a distance of thirty feet. The afternoon of the same day at Lake Crystal I watched fourteen Blue-winged Teals from about forty feet for half an hour. One of these came up on the bank within fifteen feet of me, where it sunned and preened itself for ten minutes. I checked this point very carefully.

At this time of year both the male and female appear as small, slightly mottled, brownish colored birds, the back, ends of the primaries, and upper tail coverts being a little darker. The back of the head, neck, and shoulders are also somewhat darker, shading off to a grayish color forward. The neck and head are more slender than that of the Green-winged Teal and the bill larger. On the water the Blue-winged Teal seems to sit flatter and hold its head farther forward than the Green-winged Teal.

In the spring the female has a faint white patch at the base of the bill and a white spot on the side of the tail at its base. The breast and belly shade off to a lightish gray. The male in the spring has a conspicuous white crescent in front of the eye with the points extending to the back. The head at this time is a slate color and the white spot at the base of the tail is quite conspicuous. The back of the male is somewhat darker than that of the female, and the breast shades off to a reddish brown.

In examining the specimens taken, the bend of the wing did not seem to fold readily or naturally under the scapulars, which no doubt accounts for the custom among taxidermists to mount the bird with the bend of the wing outside, where the blue is plainly visible.—Bruce F. Stiles, *Sioux City, Iowa.*

Recent Records of the Orange-crowned Warbler Near Toledo, Ohio.—Because of a scarcity of records of the Orange-crowned Warbler (*Vermivora celata celata*) both in Ohio and in Michigan, the following sight records and specimens collected in the vicinity of Toledo, Ohio, which is close to the Ohio-Michigan boundary, are given. On October 4, 1931, in Washington Township, Lucas County, Ohio, one was found in giant ragweed by L. W. Campbell (sight record). On May 8, 1932, in Spencer Township, Lucas County, Ohio, one was seen in a white oak woods by L. W. Campbell (sight record). On May 14, 1932, in Lakeside, Ottawa County, Ohio, one was seen in second growth woods by L. W. Campbell (sight record). On May 6, 1933, in Woodlawn Cemetery, Toledo, Ohio, one was seen in a tamarack tree by L. W. Campbell (sight record). On September 28, 1933, an immature male was taken by Bernard R. Campbell in Jerusalem Township, Lucas County, Ohio, in second growth along the Lake Erie Beach. The skin is in the Ohio State Museum. On October 12, 1933, an adult female with crossed mandibles was taken by B. R. Campbell in giant ragweed three and one-half miles southwest of Toledo, Ohio. This specimen is in the University of Michigan collection. On September 23, 1934, an immature female was taken by L. W. Campbell in low growth along the Lake Erie Beach in Jerusalem Township, Lucas County, Ohio. This specimen is in the Ohio State Museum. On September 30, 1934, an adult male was shot by L. W. Campbell, which was too badly mutilated to be preserved. Another was seen the same day by L. W. and B. R. Campbell. Both of these birds were found in second growth in Jerusalem Township, Lucas County, Ohio. On October 6, 1934, six birds were found in giant ragweed in Adams and Springfield Townships, Lucas County, Ohio, by L. W. and B. R. Campbell. Of these, three were collected, as follows: Adams Township, Lucas County, Ohio, male—L. W. Campbell, University of Michigan Museum; Springfield Township, Lucas County, Ohio, male—B. R. Campbell, Ohio State Museum; Springfield Township, Lucas County, Ohio, male—collected by L. W. Campbell, prepared by B. R. Campbell, Ohio State Museum. On October 27, 1934, one was seen in a brushy place in Springfield Township, Lucas County, Ohio, by L. W. Campbell and James Nessle (sight record). On September 21, 1935, an immature female was collected in giant ragweed in Erie Township, Monroe County, Michigan, by L. W. Campbell. The skin, made up by B. R. Campbell, is in the University of Michigan Museum. On September 26, 1935, in low growth along the Lake Erie Beach, Jerusalem Township, Lucas County, Ohio, an adult female was taken by L. W. Campbell. The skin is in the Ohio State Museum. On October 6, 1935, three were seen along the shore of Maumee Bay in Jerusalem Township, Lucas County, Ohio, in second growth woods by L. W. Campbell (sight record).

From the above instances, we conclude that in the Toledo area the Orange-crowned Warbler is an uncommon migrant in the spring, but a regular migrant in small numbers during the fall migration, arriving later than the majority of other warblers. A partiality to giant ragweed in the fall is also indicated.—Louis W. and Bernard R. Campbell, *Toledo, Ohio.*

Further Additions to the List of the Birds of Yellowstone National Park.—Reference is made to two papers by Emerson Kemsies (WILSON BULLETIN, September, 1930, pp. 198-210; and March, 1935, pp. 68-70) listing the birds known to occur in Yellowstone National Park. Checking the lists carefully, the writer finds two additional species that properly belong. These are given below, with records and references.

Farallone Cormorant (*Phalacrocorax auritus albociliatus*). Dr. Harry M. Kelly, ranger naturalist for a number of summers at Yellowstone Lake, informed the writer that a pair of these birds nested on the Molly Islands in 1928, and that he observed the nest with two half-grown young in that year. On June 26, 1930, Ludwig von Feuhrer, a Park Service taxidermist, found two nests of this cormorant, and observed two pairs of birds on the Molly Islands. One nest contained four eggs, the other was empty. The writer visited the islands on July 1, 1930. The two nests, both empty, were seen, but only two birds, very shy, were noted. The specific status of these cormorants had never been established, as they were very hard to observe. The writer, who had at that time seen very few cormorants, mistakenly considered them to be Baird's Cormorant, from their apparently small size, and so recorded them in the *Yellowstone Nature Notes* for August, 1930.

On June 29, 1931, Ranger Naturalist J. T. Stewart visited the islands and found two nests, each containing four eggs. All four adults were seen. His observations were recorded in *Yellowstone Nature Notes*, July, 1931. On July 18, 1931, the writer spent a short time on the nesting ground with a party led by George M. Wright, Chief of the Bureau of Wildlife Survey, National Park Service. Four cormorants were seen, but both nests were empty. On this visit the whitish crests and large size of the birds were plainly seen, proving them to be some form of Double-crested Cormorant and not Baird's Cormorant, as the writer had thought. Further, Baird's Cormorant, a Pacific Coast species entirely, would be far out of its known range here. So when one of these birds is examined at close range, it probably will be found to be the Farallone Cormorant.

George M. Wright (*Condor*, July-August, 1934) notes the finding of a nest containing three eggs, and of seeing two birds on June 4, 1932. In this paper he uses both the terms "Farallone" and "Double-crested" in designating the birds, and it is assumed that these names are used synonymously.* On July 12, 1932, the writer, with Ben Thompson of the Bureau of Wildlife Survey and Park Rangers Al Elliott and Frank Anderson, visited the Molly Islands for the purpose of banding young gulls and pelicans. Four adult cormorants were seen, but there was no sign of the nest reported earlier by Wright.

From these notes it would seem that one or two pairs of Farallone Cormorants nest each season on the Molly Islands, but that they rarely rear young, perhaps because of the abundance of California Gulls on the tiny, crowded islands.

Black Duck (*Anas rubripes tristis*). It is the writer's belief that there are no published records of this bird for Yellowstone Park. Three definite sight records are presented here. On August 23, 1932, two birds were seen on Junction Lake, a small glacial "pothole" in the Lamar Valley. Half an hour later three

*The Farallone Cormorant is a subspecies of the Double-crested Cormorant. It would seem desirable to have these records of the Farallone Cormorant for Yellowstone Park verified by further observations or specimens.—Ed.

birds were noted on Trumpeter Lake, a larger pothole lying immediately south of the first-named pond. It is possible that two of these were the two previously flushed from Junction Lake.

Black Ducks were not seen again until August 28, when three birds were recorded with a flock of Mallards on a little pond about two miles north of the above locations. Both Park Ranger Ben Arnold and Mrs. Marguerite Arnold, who have lived in this district for a number of years, told the writer that they believed they had seen Black Ducks on these lakes in former years, but were unable to give any definite dates.—COMPTON CROOK, *Western Reserve University, Cleveland, Ohio.*

Behavior of the White-fronted Goose at Tl-Ell, Queen Charlotte Islands, B. C.—On the evening of May 15, 1935, as I lay concealed beside the tidal flats on the Tl-ell River, a line of thirty geese flying abreast and twenty-five yards or so above the ground came straight toward me. A few birds were talking. Twenty-eight were White-fronted Geese (*Anser albifrons albifrons*) and two were Cackling Geese (*Branta canadensis minima*). When the flock was about fifty yards from me the birds swung into the southwest wind and, with wings bent down from the carpal angle, yellow feet thrust forward and webs extended, slanted down to a sand flat in the river. They alighted as they had arrived, in a long line, and for about ten minutes kept this alignment. As they stood thus, on the sandy stretch of river bottom where shallow pools of water glistened, some birds drank, thrusting the neck forward then throwing back the head to swallow the water, without moving from their position in the line. Others thrust heads into the shallow water and remained so for a minute or longer, perhaps taking sand. One bird stretched out a wing and balanced on one foot while combing the wing with the other. Accompanying these movements was a low, murmuring chatter of voices.

The birds were less than 100 yards distant, the light was perfect and binoculars revealed each feature in detail, the brilliant yellow feet, the pinkish bills, the white foreheads and the massed black on the bellies of the older geese. The two Cackling Geese in relation to the others appeared less than two-thirds the size.

Presently the birds became restless and individuals moved a short distance to one side or the other but kept the general alignment. Finally those at the end of the flock nearest to the salt grass meadow began walking toward it and soon the whole company was in motion and still in single file they paced, with rather long steps, toward the grass fifty yards away. Over a deep channel they swam and, still in single file, climbed a two-foot bank and on to the meadow grass. One bird, probably a male, seized with its bill a smaller bird by the tail coverts and held on with outstretched neck while the one thus held walked straight ahead, paying no attention to its follower. Six birds rose and after making a wide circle over the meadow and calling loudly dropped again to the main flock.

After all had reached the meadow they kept walking ahead in a fairly straight course but no longer in single file, seizing a piece of grass here and there without pausing. Fifteen minutes after reaching the meadow the birds had traveled about half a mile, passing through a wire fence on the way, and no longer were distinctly visible. On May 17 seven visited the meadows. These were the last seen.—J. A. MUNRO, *Okanagan Landing, B. C.*

ORNITHOLOGICAL LITERATURE

295 American Birds. Published and distributed by the University of Minnesota Press, Minneapolis, Minn. Price, $2.00.

The beautiful colored plates which illustrate "The Birds of Minnesota", by Dr. Thos. S. Roberts, have been previously mentioned in these pages. These plates were, for awhile, made available as separate and loose sheets. They have now been put together between stiff covers and held by a coiled spring binder. There are ninety-two plates, showing 295 species of birds which are found in the Mississippi Valley. These plates are the work of several artists, Major Allan Brooks, George Miksch Sutton, Walter Alois Weber, Walter John Breckenridge, Francis Lee Jaques, and the late Louis Agassiz Fuertes. It is an unusual collection of colored bird plates by noted American artists. —T. C. S.

The Birds of Nevada. By Jean M. Linsdale. Pac. Coast Avifauna, No. 23. Cooper Ornith. Club, Berkeley, Calif. 1936. Pp. 1-145, one map. Price, $4.00.

Most of the work on the ornithology of Nevada has hitherto been scattered. The work here listed is a summary of all that is known at the present time of the distribution of species within this state. It is a much needed publication.—T.C.S.

Birds of the Charleston Mountains, Nevada. By A. J. Van Rossem. Pac. Coast Avifauna, No. 24. Cooper Ornith. Club, Berkeley, Calif. 1936. Pp. 1-65, figs. 13.

The Charleston Mountains are located in the extreme southern tip of Nevada, not far to the eastward of Death Valley. These mountains are described as "boreal islands", surrounded by Sonoran deserts. The present work is an annotated list of 160 species. The list contains several forms which are not recognized by the A. O. U. Check-List. In a few cases the vernacular name has been made to vary from the Check-List. A foot-note explanation of such variations from established usage might be appreciated by many readers.—T. C. S.

Procedure in Taxonomy. By Edward T. Schenk and John H. McMasters. Stanford Univ. Press, Stanford University, Calif. 1936. Pp. 1-72. Price, $2.00.

We know of no other single volume which covers quite the same ground. The book is small, because it is concisely written. One chapter is on types, and defines the various types from holotype to topotype and plastotype. The storage of type material is also discussed. The procedures for describing new species and for compiling synonymies are presented. The appendix, which occupies a little more than half of the book, reprints the International Rules of Zoological Nomenclature, together with summaries of official interpretations rendered. Little is said of the status of, and rules governing, subspecies. While the book is written primarily for palaeontologists the same rules apply throughout the zoological field.—T. C. S.

Distribution of Breeding Birds of Ohio. By Lawrence E. Hicks. Bull. No. 32, Vol. VI, Ohio Biol. Survey. 1935. Pp. 123-190. Price, 75 cents.

The author reports on the breeding of 181 species of birds within the state of Ohio, basing the report on the literature and recent unpublished studies. The breeding status of each species is adequately discussed for the different parts of the state. A table shows the breeding status of the Ohio list in the seven adjacent states. A three-page bibliography is appended. No index.—T. C. S.

INDIANA AUDUBON SOCIETY 1935 YEAR BOOK. Published by the Indiana Audubon Society. Pp. 1-98. Numerous Illustrations. Price, $1.00 (Harold A. Zimmerman, Sec.-Treas., 915 West Gilbert St., Muncie, Ind.).

The front article is an encomium of T. Gilbert Pearson, well known for his work in the Audubon Association. Dr. Earl Brooks continues his anecdotes about the Robin. A paper by L. A. Test shows that more than 200 Blue Jays have been banded at West Lafayette; and the question whether the Blue Jay migrates from that locality seems to be in doubt. The Indiana Audubon Society holds an annual meeting, which was held at Indianapolis in 1935. The membership appears to be over 200.—T. C. S.

PRELIMINARY CHECK LIST OF THE BIRDS OF DALLAS COUNTY, TEXAS. Revised August 15, 1935. By Jerry E. Stillwell. Privately published by the Author, Dallas, Texas. Mimeographed pp. 1-53.

This check list has been made up to serve local needs, and therefore includes a number of expected species in addition to those actually found. A previous list was published in 1934, the present one being a revised edition. The present (1935) list "contains 412 birds, of which 273 have been recorded, leaving 140 on the 'possible' list." A remarkable amount of information concerning most of the species treated is given in a minimum of space; and the inexpensive mode of publication places it within easy reach of those interested.—T. C. S.

THE BIRDS OF NORTHERN PETEN, GUATAMALA. By Josselyn Van Tyne. Misc. Pub. No. 27, Mus. Zool., University of Michigan. 1935. Pp. 1-46.

Two hundred and twenty-two species and one new subspecies are listed in this report.—T. C. S.

THE BIRDS OF KODIAK ISLAND, ALASKA. By Herbert Friedmann. Bull. Chicago Acad. Sci., V, No. 3, September, 1935. Pp. 1-54.

After reviewing the work which has been done in this region the author gives an annotated list of 142 birds.—T. C. S.

PROCEEDINGS OF THE LINNAEAN SOCIETY OF NEW YORK. No. 47 for 1935. Published by the Society at the American Museum of Natural History, New York. Issued in March, 1936. Pp. 1-142. Price, 75 cents.

The first paper is an obituary of Mr. Warren Francis Eaton, with portrait. There follows a posthumous paper by Mr. Eaton on the birds of Essex and Hudson Counties, New Jersey. This is an extensive paper which gives the status of 297 forms in one or both of the counties treated. This list is preceded by a careful historical and ecological analysis of the avifauna. Mr. C. A. Urner contributes a paper on the status of various species of shore birds on the north and central New Jersey coast. Mr. Joseph J. Hickey presents an extensive review of the ornithology of the New York region during 1934. A number of other papers on birds make this issue again wholly ornithological.—T. C. S.

WINTER BIRDS AROUND MY HOME. By Thomas G. Scott and George O. Hendrickson. Ames, Iowa.

This is a pamphlet for the use of schools, clubs, or individuals, giving short sketches and outline drawings of twenty-four Iowa winter birds. The drawings are the work of Sid Horn, and are to be colored with crayons or paint by the

pupil. The work of the authors and artist is good, but the work of the editor is slip-shod. Whether the pamphlet is part of any series is not shown, and it is not dated. Names of the authors are given in an obscure corner. Usually when the name of the author is misplaced it is in order to give prominence to some "director", but no such submergence is evident here.—T. C. S.

THE BIRDS OF ZION NATIONAL PARK. By C. C. Presnall. Reprinted, Proc. Utah Acad. Sci. Arts and Lett., XII, 1935, pp. 196-210.

Mr. Presnall reports 140 kinds of birds known to occur in the Zion National Park. He points out that the regular tourist season is not the best time for bird observation in this area. The author follows the rule of using trinomials only where specimens have been taken, but introduces names not yet granted by the A. O. U. Check-List.—T. C. S.

The *Journal of Minnesota Ornithology* makes its appearance with Volume I, No. 1, for April, 1936. It is announced as an "Annual devoted to Minnesota Bird Life", and is published by the T. S. Roberts Ornithology Club, at fifty cents (address, Prof. George W. Friedrich, State Teachers College, St. Cloud, Minn.). A portrait and short sketch of Dr. Roberts are given in the first pages. Dr. H. C. Oberholser contributes a short list of birds from the Lake Traverse and Heron Lake regions, based on observations made in 1919. Dr. T. S. Roberts reports an October storm with high duck mortality in northern Minnesota in 1935. Several bird lists are published: one list from central Minnesota includes 239 species; another names 125 breeding species in the St. Cloud region; another is a short list for Heron Lake. Dr. Roberts reports the nesting of the Great Gray Owl in Minnesota.

The main article in the current number of the *Snowy Egret* (Spring, 1936, XI, No. 1) is an annotated list of birds observed in the Upper Peninsula of Michigan. The list includes 141 species. Another writer describes the flight song of the Phoebe. Prentice Preace gives a concise and clear description of the behavior of the Road-runner, especially when in conflict with a rattlesnake.

Mr. Harry B. Hall, of the Kansas State Teachers College at Pittsburg, Kansas, has published a list of "The Birds of Southeastern Kansas with Migration Dates" in the *Transactions of the Kansas Academy of Science*, Vol. 38, 1935, pp. 311-315. This list contains 208 species. In the same volume Mr. M. W. Mayberry presents a paper on the "Origin and Development of the Crop of the Chick", pp. 325-327, with four plates.

Iowa Bird Life for June, 1935, has an article by Dr. P. L. Errington on the Bob-white in Iowa. Mr. William Youngworth writes on the Blue Goose in Iowa. In the issue for September, 1935, (V, No. 3) Mr. Philip A. DuMont lists the private collections of birds in Iowa, and gives a brief description of each. The same author brings the Starling records up to date, and records the Magpie invasion of Iowa in 1934-1935. The December number is devoted wholly to a five-year index of the periodical. The leading article in the March, 1936, issue (VI, No. 1) is on the present status of the Prairie Chicken in Iowa, by William Youngworth, and indicates that this species is still resident in many parts of the state, though in small numbers. Each issue contains many short articles on the ornithology of Iowa.

The *Cardinal* for January, 1936, (IV, No. 3) presents an article by Maurice Brooks on the birds of the spruce belt of West Virginia, which lies chiefly above the 3000-foot level. It is interesting to note in this list many birds which in the interior are found only in much higher latitudes where temperature and vegetation are more or less comparable. Mr. Bayard H. Christy gives an interesting account on the feral life of Rock Doves in the city of Pittsburgh. Reference is also made to other reports of similar reversions to nature by this species.

In the *Florida Naturalist* for June, 1935, Mr. Robert C. McClanahan begins a fifty year comparison of the bird life at Gainesville, which is completed in the October number. Messrs. C. R. Mason and R. J. Longstreet contribute, in the January, 1936, number (IX, No. 2) a most entertaining account of the Tortugas Islands. The history includes the establishment of Fort Jefferson in 1846, its abandonment in 1873, revival in 1898, its abandonment again in 1901, and its conversion into a National Monument in 1934, under the control of the National Park Service. In 1907 the Carnegie Institution of Washington established a Marine Biological Laboratory on these islands, and here it was that Dr. J. B. Watson carried on his well known studies on the behavior of the Noddy Tern and Sooty Tern. Announcement is made in this number of the annual meeting of the Florida Audubon Society to be held at Winter Park in March.

Wildlife Review is a new and mimeographed publication issued by the U. S. Biological Survey for a new and distinct purpose. We have seen No. 1, for September, 1935, and No. 2, for January, 1936. It is at present conducted by W. L. McAtee. Its purpose is to present short abstracts of the literature on wildlife conservation and wildlife management. In the first number we find abstracts of papers on the following subjects: conservation (3 titles); cycles (2); disease (12); ecology (10); education (1); food habits (5); life histories (4); management (34); propagation (22); restocking (7). Number 2 was issued in January, 1936, and contains a similar lot of abstracts.

No. 3, for April, has also been distributed, and is similar in plan to the other numbers, except that a useful list of American sportsmen's magazines is included.

We wish only to say that the purpose and plan of the *Wildlife Review* are splendid. So much literature is being published on the subjects of conservation and management of wildlife, and in so many different places, that very few workers will have access to all of it. The enormous amount of literature in all biological fields has made the matter of abstracting very important. We hope there may be no question about the continuance of this abstracting service by the Survey. But the value of it would justify a printed bulletin rather than one by the mimeograph process.

In *News from the Bird Banders* for July, 1935 (X, No. 2), Dr. J. J. Parsons relates some experiments with hummingbirds. One orphan Costa Hummingbird, weighing only seven and a half grains, was placed in the nest of a Black-chinned Hummingbird, and was accepted and fed by the mother bird, in spite of a marked difference in ages of her own and the adopted one. Later the same adult was found to be caring for two nests at the same time—one

containing young, the other eggs. The August number contains a very complete history of the decline of the Ivory-billed Woodpecker. The February, 1936, number (XI, No. 1) announces that Mr. T. T. McCabe relinquishes editorship of the *News*, and will be succeeded by Mrs. M. C. Sargent, of Pasadena. Mr. and Mrs. H. Michener also present a comparative study of the singing of male mockingbirds.

The *Inland Bird Banding News* for September (VII, No. 3) and the December number for 1935 (VII, No. 4) bring reports on the activities of the Inland Association. The latter number has the minutes of the 1935 annual meeting, a sketch of the late Percival Brooks Coffin, and an index for the first five volumes, 1929-1933, of the periodical. The March number for 1936 (VIII, No. 1) has a note by Dr. J. F. Brenckle on the effect of dust storms on Burrowing Owls, and also notes by O. M. Bryens on age records of various birds.

The *Redstart* is issued by the Brooks Bird Club, of Wheeling, W. Va. The December number for 1935 (III, No. 3) consists mainly of a very readable article on the songs of warblers. In the March, 1936, number (III, No. 6), the matter of field identification of subspecies is given some editorial attention, indicating rather widespread interest in it. The April number (III, No. 7) gives a report of the Erie meeting of ornithologists and conservationists. This was a regional meeting attended by representatives from Ohio, Pennsylvania, New York, Ontario, and West Virginia. The plan agreed upon was to form a very loose organization, without dues, and without attempting the merging of any existing organizations. Mr. Bayard H. Christy, of Pittsburgh, was made Executive Chairman, and a vice chairman was named from each district.

The *Raven* is issued monthly in the interest of Virginia ornithology by the Virginia Ornithological Society. Many notes of local and general interest are put on record. For instance, the September-October number (1935, VI, No. 9-10) reports the Arkansas Kingbird for November 16, 1931. And in a historical paper (February-March, 1936, VII, No. 2-3) Mr. John B. Lewis tells of taking a specimen of the Green-tailed Towhee in the winter of 1907-1908. It is doubtless on the basis of this specimen that the A. O. U. Check-List lists this western species as accidental in Virginia. This number also contains the minutes of the Sixth Annual Meeting of the V. S. O. The report shows the Society to be in a flourishing condition, and we hope the *Raven* continues to make its regular trips, as usual. No. 1 for January we did not see.

We note the issuance of several mimeographed periodicals from Missouri. The *Saint Louis Bird Club Bulletin* is the official organ of the St. Louis Bird Club. It has now reached Volume 4, No. 8, for November, 1935. The *News Letter* of the Audubon Society of Missouri has issued January, February, and April copies and Bulletin No. 1, for 1936. *Nature Notes* is the Journal of the Webster Groves Nature Study Society, of which we have seen only No. 9 of Volume VIII, for January, 1936. The *Night Heron* is published privately by Messrs. John O. Felker and John P. Stupp, at Clayton, Mo., and has passed through Volume 3, No. 9, for September, 1935.

A new mimeographed publication to reach us is *Bird Notes*, issued by the Superior (Wis.) Audubon Society (Mrs. E. L. Bolender, 92 Maple Ave., Superior, Wis.—Dues, $1.00 per year). The initial number (Vol. I, No. 1, 1936) contains papers on the activities of the Society, on winter birds of the region, on certain Purple Finches, the winter feeding of game birds, planting to attract birds, protection of hawks and owls, and short notes.

The *Chickadee* for June, 1935 (Vol. V, No. 1) publishes a 1935 spring migration list, minutes of the Forbush Bird Club's meetings and field trips, and various news notes.

Some of our readers may be interested in a new monthly magazine called *Nature Notes*, which first appeared with the January number for this year. The numbers thus far issued averaged about twenty-four pages of interesting and timely articles on all phases of nature lore. The numerous illustrations are from excellent photographs. The March number reports a field observation of two Arkansas Kingbirds in the western part of Michigan on May 31, 1935, the evidence for which seems to be satisfactory. The subscription price is $1.00 per year, and the address is 4800 Prospect Road, Peoria, Ill.

The *Bird Calendar of the Cleveland Bird Club* is a mimeographed bulletin which seems to be older than most similar publications now current, the January, 1936, number being marked "31st Year, Bulletin No. 4". The eleven pages of this number are filled with local notes and statistics, and fall migration records.

The *Game Research News Letter* (mimeographed) is issued by the Department of Game Management at the University of Wisconsin, and gives information of the current activities in training game management workers at this University.

The *Migrant* for last December contains an account of ornithological work done at Peabody College by Dr. Shaver's students, nineteen theses being listed. The issue for March (VII, No. 1) mentions twenty species of birds to be added to Ganier's "Distributional List of the Birds of Tennessee". Both numbers carry the halftone plates which Mr. Gainier inaugurated.

The *Prothonotary* is published by the Buffalo (N. Y.) Ornithological Society. The subscription is 50 cents a year, and may be sent to Mrs. Geo. C. Kratzer, 140 Wardman Road, Kenmore, N. Y. It gives records of field trips and news of local events. The March number announces a regional meeting of bird students to be held at Erie, Pa., on March 14 and 15. The April number indicates that this meeting was held. We would have been glad to learn more about it.

The *Flicker* continues to appear at its regular intervals of February, May, October, and December. It is issued by the Minnesota Bird Club. The officers are: Charles Evans, President; Robert Turner, Vice-President; Robert Upson, Secretary-Treasurer, 4405 Lyndale Ave., S., Minneapolis; George Rysgaard, Editor.

EDITORIAL

For About Two Years Mrs. Margaret M. Nice has been preparing for *Bird-Banding* a topical review of current ornithological literature, on a plan somewhat similar to that employed in *Biological Abstracts*. For example, the last number of the magazine (April) classifies the abstracts under the following topical headings: Bird-Banding, Migration, Homing, Longevity, Life History, Song, Ecology, Bird Behavior, Books. Here a worker may readily turn to the particular group of literature which most concerns him. With a file of the magazine at his service the ornithologist is even better equipped than with *Biological Abstracts*, in which emphasis is placed on taxonomy. And it is of the greatest value that this abstracting service covers also the European ornithological magazines, to which complete citations are made. We regard this work as one of the most valuable contributions to ornithology now being regularly published. If now, somewhere, there could be made available a pretty complete list of all ornithological periodicals, with addresses from which copies might be obtained, it would seem that the ornithological worker would be well equipped. Any expansion of this work which might be found possible should receive the appreciative support of all concerned.

Mr. A. M. Bailey has been appointed Director of the Colorado Museum of Natural History, at Denver, where he was at one time Curator of Birds and Mammals. Mr. Bailey will be missed in the Mississippi Valley, and will carry with him the best wishes of many friends.

One of our most pleasant contacts at the 1934 Pittsburgh meeting was with Mr. Warren F. Eaton, who represented the National Association of Audubon Societies. His affable and enthusiastic personality engendered feelings of highest regard. And we felt certain that he was a young man with promise of a brilliant future. It was with sadness, therefore, that we read of his death on February 16, at the age of thirty-five years.

The Eleventh Annual Meeting of the Cooper Ornithological Club was held in Los Angeles in April. Dr. Guy C. Rich kindly sent us a copy of the program listing thirty-one papers. Mr. Harry Harris favored us with an artistic announcement of the Art Exhibit held in connection with this meeting. This exhibit consisted of forty-four original paintings of birds and mammals by Major Allan Brooks, some of which were on sale.